



User Manual

Understanding the full capabilities of DCPM



Revision

| Date | Name | Comment | DCPM Version |
|------------|-------------------|--|--------------|
| 11/10/2012 | Kris De Peuter | Create manual basics | 1.3.3 |
| 15/06/2013 | Lesley Zonnekein | Review manual and add installation information | 1.3.3 |
| 08/07/2013 | Lesley Zonnekein | Add information on settings Formulas, add new features of 1.3.4 | 1.3.4 |
| 11/10/2013 | Lesley Zonnekein | Add information on maps | 1.3.4 |
| 28/01/2014 | Lesley Zonnekein | Add information on version 1.3.5 & create a complete new structure for this manual, adding info on macro's | 1.3.5 |
| 23/04/2014 | Lesley Zonnekein | Add new install procedure and update manual for version 1.4 | 1.4 |
| 14/05/2014 | Lesley Zonnekein | Add installing external database procedure. | 1.4 |
| 30/07/2014 | Rick Van Overbeke | Update installing external database procedure. Remove prerequisite of postgres version 8.4 | 1.4 |
| 25/11/2014 | Lesley Zonnekein | Add new download link for version 1.5 | 1.5 |
| 20/2/2015 | Lesley Zonnekein | Add upgrade procedure from 1.5 to 1.5.1 | 1.5.1 |

Index

| | |
|--|----|
| Revision | 2 |
| Index | 3 |
| Welcome | 15 |
| About this document..... | 15 |
| About DCPM..... | 15 |
| Installation..... | 16 |
| Hardware requirements | 16 |
| Application server (without db): | 16 |
| Database server:..... | 16 |
| Evaluation version hardware - Application server with internal DB | 16 |
| PREREQUISITES..... | 16 |
| Installing external Database | 17 |
| Overview..... | 17 |
| Install DB on Server | 17 |
| Install operating system | 17 |
| Install the Database postgresql | 18 |
| Install DCPM Database | 19 |
| Create 2 different databases..... | 19 |
| Create a user to access the database..... | 19 |
| Grant access for the created user to the created databases | 19 |
| Alter database to the DCPM user..... | 19 |
| Alter the bytea_output setting on the main database..... | 20 |
| Change your configuration files to have external access to your created databases... | 20 |
| Nice to know:..... | 20 |
| Installing DCPM | 21 |
| Update from version 1.3.4 to version 1.3.5 | 28 |
| Update from version 1.3.5 to version 1.4.0 | 28 |
| Update from version 1.4.0 to version 1.5.0 | 29 |
| Update from version 1.5.0 to version 1.5.1 | 29 |
| Uninstall DCPM older versions..... | 30 |
| Uninstall DCPM latest versions | 30 |
| Configure a HTTPS access on DCPM..... | 31 |
| First set up | 32 |
| Initial Setup..... | 34 |
| Components | 34 |
| DCPM Navigation | 37 |

| | |
|--|----|
| Main window | 37 |
| Interface | 38 |
| Spaces | 38 |
| Pages | 38 |
| Bookmarks | 39 |
| Detailed browsing in DCPM | 39 |
| Tags & Labels | 39 |
| Tag | 39 |
| Label | 39 |
| Search function in DCPM | 40 |
| Simple Search | 40 |
| Advanced Search | 40 |
| Admin Space: Administration - Settings | 41 |
| Settings | 41 |
| SMTP settings | 41 |
| SNMP settings | 41 |
| Setting preferences | 41 |
| Setting Alarms | 42 |
| Contact Information | 43 |
| UI Settings | 43 |
| System maintenance | 44 |
| Manage your setup | 45 |
| General information | 46 |
| Configuration | 46 |
| Map editor | 46 |
| Create maps | 47 |
| Uploading a new map file | 47 |
| Creating a new map | 47 |
| Assign map | 47 |
| View maps | 49 |
| Formula editor | 49 |
| Create new formula: | 50 |
| Presenting your formula value on a template: | 51 |
| Schematics editor | 51 |
| Create new schematic | 51 |
| Add corresponding object and values: | 52 |
| Presentation of the scheme in DCPM | 52 |
| Firmware update/upgrade | 52 |

| | |
|---------------------------------------|----|
| Administration - User Management..... | 54 |
| Add a user..... | 54 |
| Changing User Passwords..... | 54 |
| Removing a User..... | 55 |
| Creating a Group | 55 |
| Renaming a Group..... | 55 |
| Adding a User to Groups | 56 |
| Assigning Rules for a Group..... | 57 |
| Revoking a Rule in a Group..... | 58 |
| Removing a Group | 58 |
| Bookmarks management | 59 |
| Space management | 59 |
| Create a Space | 59 |
| Delete a Space | 60 |
| Rename a space..... | 60 |
| Change page lay out | 61 |
| Devices..... | 61 |
| Autodiscovery..... | 61 |
| Configure EnergySwitches..... | 62 |
| Discovered EnergySwitches..... | 62 |
| Unconnected hardware..... | 62 |
| All monitored hardware | 63 |
| Created devices | 63 |
| Unconfigured devices..... | 63 |
| Alarm definitions | 63 |
| Miscellaneous..... | 63 |
| View documentation | 63 |
| View audit logs | 63 |
| Contact us..... | 64 |
| View Space | 64 |
| Manual creation of a structure | 65 |
| Enterprise | 65 |
| Location | 65 |
| Datacenter..... | 65 |
| Floor..... | 66 |
| Room | 66 |
| Pod..... | 67 |
| Row..... | 67 |

| | |
|--|----|
| Rack | 67 |
| Graphs presented in the structure | 69 |
| Feed | 70 |
| Edit Feed..... | 70 |
| Additional parameters..... | 70 |
| Cost calculation | 71 |
| Sub-feeds | 71 |
| Feed information..... | 72 |
| Delete components | 73 |
| Access device WebGUI | 73 |
| On Device page..... | 73 |
| Via Tunneling | 73 |
| Edit & Reconfigure Energy Switches | 74 |
| EnergySwitch set up | 74 |
| Reconfigure EnergySwitches | 75 |
| Edit Energy Switch | 75 |
| Edit Energy switch | 75 |
| Configure the Energy Switch | 75 |
| Additional monitoring | 76 |
| Feed monitor | 76 |
| Create Feed monitor | 76 |
| Identify Feed monitor..... | 78 |
| Energy Consumer | 78 |
| Create Energy consumer | 79 |
| Devices..... | 81 |
| Created devices | 82 |
| Outlet grouping | 83 |
| Racktivity agent | 84 |
| Installation..... | 84 |
| Configuration..... | 85 |
| main..... | 85 |
| shutdown..... | 85 |
| reboot..... | 86 |
| monitor | 86 |
| Alarms..... | 86 |
| About Alarms..... | 86 |
| Creating Alarms | 88 |
| The Alarm Wizard..... | 88 |

| | |
|---|-----|
| Information Sources | 89 |
| SNMP | 89 |
| Scope | 89 |
| Source | 89 |
| Condition | 89 |
| Monitoring..... | 89 |
| Scope | 89 |
| Type | 89 |
| Condition | 90 |
| Trending..... | 90 |
| Scope | 90 |
| Type | 90 |
| Condition | 90 |
| Periodic..... | 90 |
| Formula | 91 |
| Actions | 91 |
| Alarm Panel | 91 |
| Alarm Message (required)..... | 92 |
| Additional information | 92 |
| SNMP Trap..... | 92 |
| E-mail..... | 93 |
| Internal Event | 93 |
| Modifying Alarms | 93 |
| Edit..... | 93 |
| Delete | 93 |
| Reporting..... | 94 |
| On demand reporting or scheduled reporting..... | 94 |
| On demand..... | 94 |
| Scheduled Reporting | 94 |
| Reporting on enterprise level..... | 95 |
| Reporting on location level | 96 |
| Reporting on datacenter Level | 98 |
| Reporting on formulas..... | 100 |
| Alarm Space..... | 100 |
| Acknowledging Alarms | 101 |
| Alarm History..... | 102 |
| Alarm Map | 102 |
| Reports space | 102 |

| | |
|-------------------------------------|-----|
| Co2 report for datacenter | 102 |
| Feeds report for datacenter | 103 |
| Energy per customer report | 103 |
| Energy per device report | 103 |
| Power per customer report | 104 |
| User space | 104 |
| Create / Edit page | 104 |
| Add page in user space | 104 |
| Edit main page screen | 104 |
| Add dashboard | 105 |
| Add widget to a dashboard | 106 |
| Doc space | 107 |
| IDE Space | 107 |
| DCPM Macros | 107 |
| PyLabs Macros | 107 |
| JavaScript Macros | 108 |
| Using Macros in Documentation | 108 |
| Macro Configuration | 108 |
| Macro Data | 108 |
| REST Calls | 108 |
| Overview of Existing Macros | 109 |
| List of Predefined Macros | 109 |
| Actions Macro | 110 |
| Parameters | 110 |
| Action Tasklets | 110 |
| Example | 111 |
| Sample | 111 |
| Aggregated Data Macro | 111 |
| Parameters | 111 |
| Example | 111 |
| Sample | 111 |
| Area Chart Macro | 112 |
| Parameters | 112 |
| Example | 112 |
| Sample | 112 |
| Bar Chart Macro | 113 |
| Parameters | 113 |
| Example | 113 |

| | |
|---|-----|
| Sample | 113 |
| Button Macro | 114 |
| Parameters | 114 |
| Example | 114 |
| Sample | 114 |
| How to Modify the Button Icon..... | 114 |
| CO2 Footprint Detailed Report Macro | 115 |
| Parameters | 115 |
| Example | 115 |
| Sample | 115 |
| CO2 Footprint Report Macro..... | 116 |
| Parameters | 116 |
| Example | 116 |
| Sample | 116 |
| CPU vs. Power macro | 117 |
| Parameters | 117 |
| Example | 117 |
| Sample | 117 |
| Camera Macro | 117 |
| Parameters | 117 |
| Example | 118 |
| Sample | 118 |
| Children Macro | 118 |
| Parameters | 118 |
| Example | 118 |
| Dashboard Macro | 119 |
| Parameters | 119 |
| Example | 119 |
| Sample | 119 |
| Device Management Macro | 119 |
| Parameters | 119 |
| Example | 119 |
| Sample | 119 |
| Energy Cost per Application Report Macro..... | 119 |
| Parameters | 119 |
| Example | 120 |
| Sample | 120 |
| Energy Switch Actions Macro | 120 |

| | |
|---|-----|
| Parameters | 120 |
| Example | 120 |
| Sample | 120 |
| Energy per Application Report Macro | 121 |
| Parameters | 121 |
| Example | 121 |
| Sample | 121 |
| Energy per Customer Detailed Report Macro | 121 |
| Parameters | 121 |
| Example | 121 |
| Sample | 122 |
| Energy per Customer Report Macro | 122 |
| Parameters | 122 |
| Example | 122 |
| Sample | 122 |
| Energy per Device Detailed Report Macro | 122 |
| Parameters | 122 |
| Example | 123 |
| Sample | 123 |
| Energy per Device Report Macro | 123 |
| Parameters | 123 |
| Example | 123 |
| Sample | 123 |
| Feeds Detailed Report Macro..... | 123 |
| Parameters | 123 |
| Example | 123 |
| Sample | 124 |
| Feeds Report Macro | 124 |
| Parameters | 124 |
| Example | 124 |
| Sample | 124 |
| Formula macro | 125 |
| Parameters | 125 |
| Example | 125 |
| Generic Macro | 125 |
| Parameters | 126 |
| Example 1 | 126 |
| Example 2 | 126 |

| | |
|--------------------------------------|-----|
| Grid Macro..... | 126 |
| Parameters | 126 |
| Example | 127 |
| Sample | 128 |
| Heat Map Detailed Report Macro | 128 |
| Parameters | 128 |
| Example | 128 |
| Sample | 128 |
| Include Macro..... | 128 |
| Parameters | 128 |
| Example | 129 |
| JqPlot Macro..... | 129 |
| Parameters | 129 |
| Examples..... | 129 |
| Line Chart..... | 129 |
| Bar Chart..... | 129 |
| Pie Chart1 | 130 |
| Block Chart..... | 131 |
| Bubble Chart..... | 131 |
| Line Graph Macro | 132 |
| Parameters | 132 |
| Example | 132 |
| Sample | 133 |
| Map Editor Macro | 133 |
| Parameters | 133 |
| Example | 133 |
| Sample | 133 |
| Map Macro | 134 |
| Parameters | 134 |
| Example | 134 |
| Sample | 134 |
| Monitormodule Live Data Macro | 135 |
| Parameters | 135 |
| Example | 135 |
| Sample | 135 |
| Multi Bar Chart Macro..... | 135 |
| Parameters | 135 |
| Example | 135 |

| | |
|---|-----|
| Sample | 136 |
| Multi Line Graph Macro | 136 |
| Parameters | 136 |
| Example | 136 |
| Sample | 137 |
| Macro Notification | 137 |
| Parameters | 137 |
| Example | 137 |
| Sample | 137 |
| Oscilloscope Macro | 137 |
| Parameters | 138 |
| Examples..... | 138 |
| Sample for time domain..... | 138 |
| Sample for frequency domain | 138 |
| Page Tree Macro | 139 |
| Parameters | 139 |
| Example | 139 |
| Sample | 139 |
| Page Validator Macro | 139 |
| Parameters | 140 |
| Example | 140 |
| PDU Live Data Macro..... | 140 |
| Parameters | 140 |
| Example | 140 |
| Sample | 140 |
| Pie Chart Macro..... | 141 |
| Parameters | 141 |
| Example | 141 |
| Sample | 141 |
| Port Data Macro | 142 |
| Parameters | 142 |
| Example | 142 |
| Sample | 142 |
| Power per Customer Detailed Report Macro..... | 143 |
| Parameters | 143 |
| Example | 143 |
| Sample | 143 |
| Power per Customer Report Macro | 143 |

| | |
|----------------------------------|-----|
| Parameters | 143 |
| Example | 143 |
| Sample | 143 |
| Protovis Macro | 144 |
| Parameters | 144 |
| Example 1 | 144 |
| Sample 1 | 144 |
| Example 2 | 145 |
| Sample 2 | 145 |
| RGraph Macro | 145 |
| Parameters | 145 |
| Example | 145 |
| Sample | 146 |
| Enterprise structure Macro | 146 |
| Parameters | 146 |
| Example | 147 |
| Sample | 147 |
| Redirect Macro | 147 |
| Parameters | 147 |
| Overriding macro usage | 147 |
| Example | 147 |
| Schematics Macro | 147 |
| Parameters | 147 |
| Example | 147 |
| Sample | 147 |
| Script Macro | 148 |
| Parameters | 148 |
| Example | 148 |
| Sample | 148 |
| Sensor Data Macro | 149 |
| Parameters | 149 |
| Example | 149 |
| Stacked Area Chart Macro | 149 |
| Parameters | 149 |
| Example | 149 |
| Sample | 149 |
| Style Macro | 150 |
| Parameters | 150 |

| | |
|--|-----|
| Example | 150 |
| Sample | 151 |
| Table Macro..... | 151 |
| Parameters | 151 |
| Example | 151 |
| Sample | 151 |
| Widget Macro..... | 151 |
| Parameters | 152 |
| Example | 152 |
| Sample | 152 |
| Wizards Macro..... | 152 |
| Parameters | 152 |
| Example | 153 |
| Sample | 153 |
| Input / output or both presentation macro | 153 |
| Parameters | 153 |
| Example | 153 |
| Sample | 153 |
| How to Create Macros..... | 153 |
| PyLabs Tasklets | 154 |
| JavaScript Macros | 154 |
| Google Maps Macro Code | 154 |
| Creating a Macro | 155 |
| Calling the Macro in a Markdown File..... | 157 |
| Release notes: | 157 |
| Release Notes - DCPM Development - Version Release 1.4.0 | 157 |
| Release Notes - DCPM Development - Version Release 1.5.0 | 158 |
| Release Notes - DCPM Development - Version Release 1.5.1 | 160 |

Welcome

About this document

Thank you for choosing the Racktivity Data Center Performance Manager solution. This document explains the basic structure, components and work flow of the DCPM platform and will guide you through a basic configuration.

We advise to carefully read this guide before using the software.

About DCPM

The Data Center Performance Manager platform is a browser based application that monitors and manages power and other environmental parameters in data centers or other facilities. All data is collected and presented to the user in an easy to use and intuitive User Interface (UI).

The DCPM UI has, amongst others, the following features:

- Monitor & manage power of your data centers, Points of Presence (PoPs), head ends, ...
- Create reports and graphs of the collected data
- Enable alarms
- Add both Racktivity hardware (EnergySwitch, Energy Sensor, DC²Sensor) and 3rd party vendor devices
- Fully customizable dashboards
- Extract reports

Many types of devices can be connected to your DCPM system, including the Racktivity EnergySwitches (AC smart Power Distribution Units (ENERGYSWITCHs)), Energy Sensors (environmental sensors), DC²Meters (DC monitoring), AC²Meters, and 3rd party devices. A typical ENERGYSWITCH consists of 8 or more power outlets that deliver power to your rack equipment and come in different form factors. Depending on the type of ENERGYSWITCH connected to DCPM you will be able to monitor (for power related metrics) and manage (outlet toggling) it to the outlet level.

In DCPM, you are not limited to working with only 1 data center: monitor and manage many data centers and remote locations spread out over different locations all in 1 system.

In short, Racktivity's Data Center Performance Manager is the ideal platform to monitor and manage the power of your IT infrastructure.

Installation

Hardware requirements

Application server (without db):

- Server: Can be a virtual server
- Operating System: According to supported OS list
- Memory: 4 GB RAM per 100 devices
- Processor: 35% of standardized 1.7GHz CPU per 100 points. For configuration of devices (servers) the user can create 3 devices for one point.
- Storage: 10GB minimum, more if logging scheme is extended (logs are kept for 3 days only by default)

Database server:

- PostgreSQL (tested with 8.4) or Oracle (tested with 11g)
- For demo/evaluation purposes (internal database) PostgreSQL it can be preinstalled on application server with installation script
- Operating System, memory, processor: According to guidelines of database administration manual
- Storage: 5 GB per 100 devices/month (for raw data).
- Note: DCPM implements data retention, that limits detailed data storage. Please consult your desired retention scheme to define storage required.

Evaluation version hardware - Application server with internal DB

(PostgreSQL):

- Memory: 4 GB RAM
- Processor: 1.7GHz CPU
- Storage: 65GB minimum

PREREQUISITES

- 64 Bit linux system
- Supported platforms:
 - Ubuntu 10.10+
 - Debian 6.0+
 - CentOS 6.0+
 - RedHat Enterprise Linux 6+
- perl should be installed on the server.
- Following ports should be available on the server
 - TCP ports 21 80/443 4369 5432 5672 8080 11211 20300 20301 20302

- UDP ports 161 162 11211
- DCPM should have access to following ports on hardware:
 - TCP ports 80/443 (HTTP/S)
 - UDP ports 161 and 162 (SNMP)
 - TCP port 502 (ModBusTCP)
 - UDP port 16388 (firmware upgrade)
- hardware should have access to following ports on DCPM:
 - UDP ports 161 and 162 (SNMP)
- DCPM is downloadable from

<http://downloads.test.rackactivity.com/dcpm/1.5.1/installationpackage.tgz>

port 88 should be open on the firewall if applicable.

Installing external Database

Overview

To Get DCPM working with an external database the end user needs to configure 2 separate databases. One database is used by DCPM as main database, the second Database is used as monitoring database.

DCPM is using postgresql DB version 8.4.x or Oracle 11g.

Following actions need to be performed:

1. Create two different Databases (Main DB and Monitoring DB)
2. Create a user and password to access those databases
3. Grant permissions for the user to both Databases
4. Alter those databases
5. Edit files postgresql.conf & pg_hba.conf

In this manual we will address creating an external DB in postgresql version 8.4.x. Postgresql is a free downloadable database.

Install DB on Server

In this section we will show you how to create the requested databases on the Server. There are two tools to use in order to create a DB:

1. Pgadmin III (graphical)
2. Psql (command line)

Install operating system

Following operating systems where tested for installation of the external Database

- Debian (Linux-64bit)

- Ubuntu Server 14.04 (Linux-64bit)
- Windows

The operating system can be installed on a virtual machine or server using the following specs:

- Storage: 5 GB per 100 devices/month (for raw data).
- Note: DCPM implements data retention, that limits detailed data storage. Please consult your desired retention scheme to define storage required.
- Memory: 4GB
- dual core CPU

Install the Database postgresql

Postgresql is free downloadable software . The user can download the postgresDB from enterprise DB:

<http://www.enterprisedb.com/products-services-training/pgdownload>

Download the required version for your operating system.

The user can create the required databases when the installation of postgresql is finished.

Install DCPM Database

Type the following command as root using the command line in the terminal:

su- postgres (Debian)

sudo su postgres (Ubuntu)

Type now *psql*

Above commands take you in the psql (command line) to create your database.

Create 2 different databases

- Type the following command to create your main database

CREATE DATABASE dcpmdb;

With the above command you create the main database called “dcpmdb”. You can use any desired name for this.

- Type the following command to create the monitoring database

CREATE DATABASE dcpmmon;

With the above command you create the monitoring database called “dcpmmon”. Again you can change the name to your desired database name.

Create a user to access the database

- Type the following command to create a user and password

CREATE USER dcpm WITH PASSWORD '1234';

With the above command you have created a user “dcpm” and a password “1234”, username and password can be chosen by the user. The defined user should be the database owner.

Grant access for the created user to the created databases

- Type the following command to grant the user access to the main database

GRANT ALL ON DATABASE dcpmdb TO dcpm;

Above command allows your created user “dcpm” to have access to your created database called “dcpmdb”.

- Type the following command to grant the user access to the monitoring database

GRANT ALL ON DATABASE dcpmmon TO dcpm;

Above command allows your created user “dcpm” to have access to your created database called “dcpmmon”.

Alter database to the DCPM user

- Type the following command to alter your created database to your created user. This action needs to be performed for both databases.

ALTER DATABASE dcpmdb OWNER TO dcpm;

Again here “dcpmdb” is the name of your created database, “dcpm” is the name of your created user.

Now the same needs to be done for your second created database. So in our example type:

ALTER DATABASE dcpmmon OWNER TO dcpm;

Again here “dcpmmon” is the name of your created database, “dcpm” is the name of your created user.

Alter the bytea_output setting on the main database

NOTE: This is only required for a postgresql database with version starting from 9.0 and up.

ALTER DATABASE dcpmdb SET bytea_output = 'escape';

This action is only required on the main database.

Change your configuration files to have external access to your created databases.

To have access to your created databases the user should change two conf files in postgres.

Go to the directory where the following postgres configuration files are stored.

- PostgreSQL.conf
- Pg_hba.conf

If you do not know the exact path of above files you can search them using the following command in LinuxOS:

Find / -name pg_hba.conf

Above to search for the “pg_hba.conf” file.

in pg_hba.conf you should make sure that the DB listens to the correct network by having the following:

host all all 192.168.14.0/24 md5

192.168.14.0/24 = an example of the network IP and mask

Now the user needs to check if the database is listening to the correct address. So look for the postgresql.conf file:

Find / -name postgresql.conf

Above to search for the “postgresql.conf” file.

Make sure that in postgres.conf there is the following line:

listen_addresses = ''*

then RESTART postgres for the changes to take effect by typing the following command:

/etc/init.d/postgres restart

Nice to know:

To Get access via SSH to the server you need to download a SSH client

[*Apt-get install openssh-server*](#)

Set up static IP on ubuntu server

http://www.youtube.com/watch?v=cjQu_1HhTro

Installing DCPM

If you are in using a windows based platform you could download Virtual box to create your own virtual linux machine.

Network settings should be set as “network bridged adaptor”

You have 2 options for installing DCPM.

1. Using an internal database (65GB of disk space required)
2. Using an external database.

To use an external database for DCPM RAW data storage, you have 2 major advantages.

1. Faster for larger deployments
2. less space required for the DCPM install (20GB)

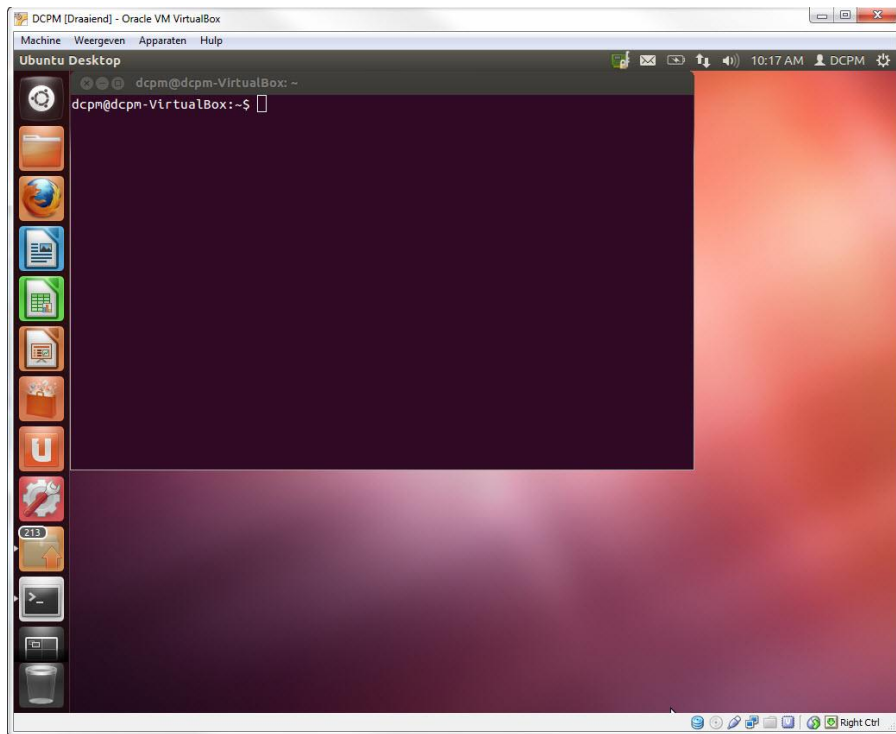
When decision is made to use an external database the database should be set up prior to installing DCPM. Supported databases are postgresql or oracle. DCPM users using the external database should maintain this DB.

There is an option in the setup to have two different types of databases however all can be installed in one database too. The two databases are:

- A main database: Storage: 5 GB
- A monitoring database: Storage: 5 GB per 100 devices/month

When Linux is installed you should open the operating system and go follow below steps for DCPM installation:

1. Open the Linux terminal



2. Login as root:

Go to root by the following command:

sudo su

or (depending on your installed OS)

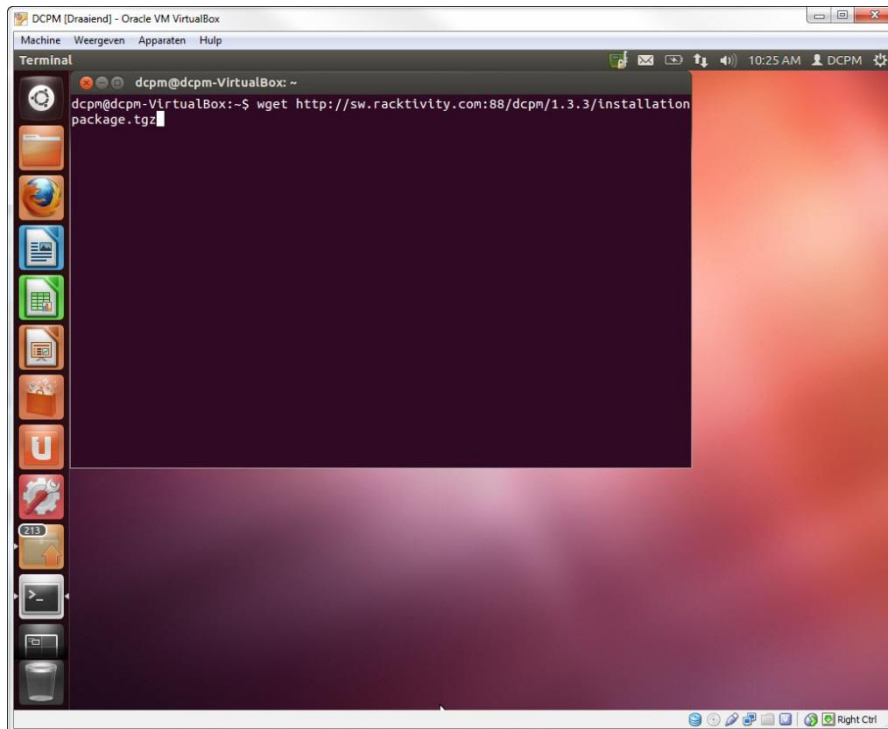
su -

You will be asked for a password which the system admin should be able to provide.

3. Download the DCPM installation package on your machine by adding the following command in the Terminal page:

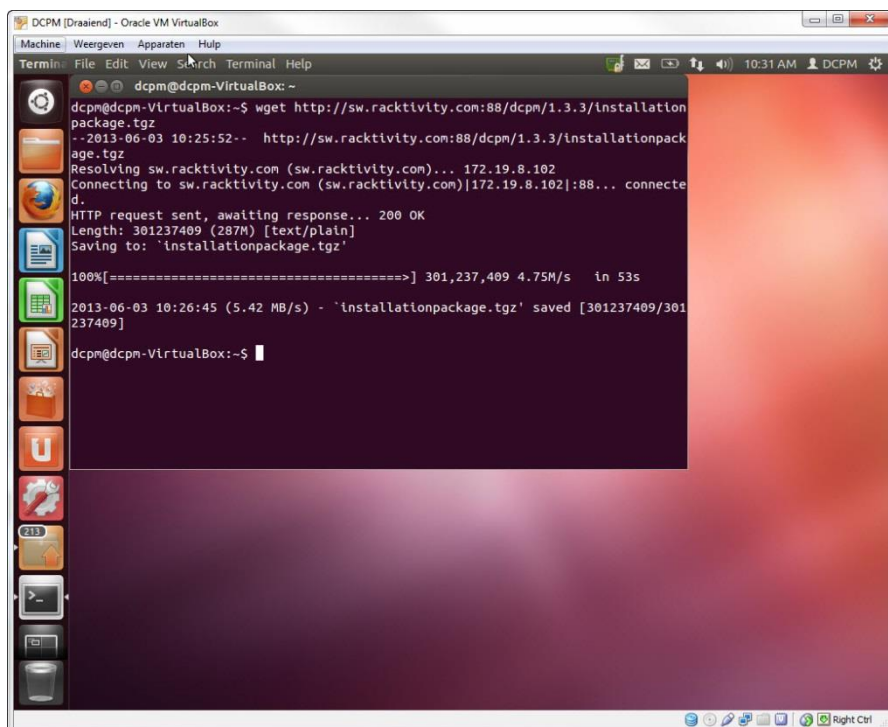
[wget http://downloads.test.racktivity.com/dcpm/1.5.1/installationpackage.tgz](http://downloads.test.racktivity.com/dcpm/1.5.1/installationpackage.tgz)

press Enter



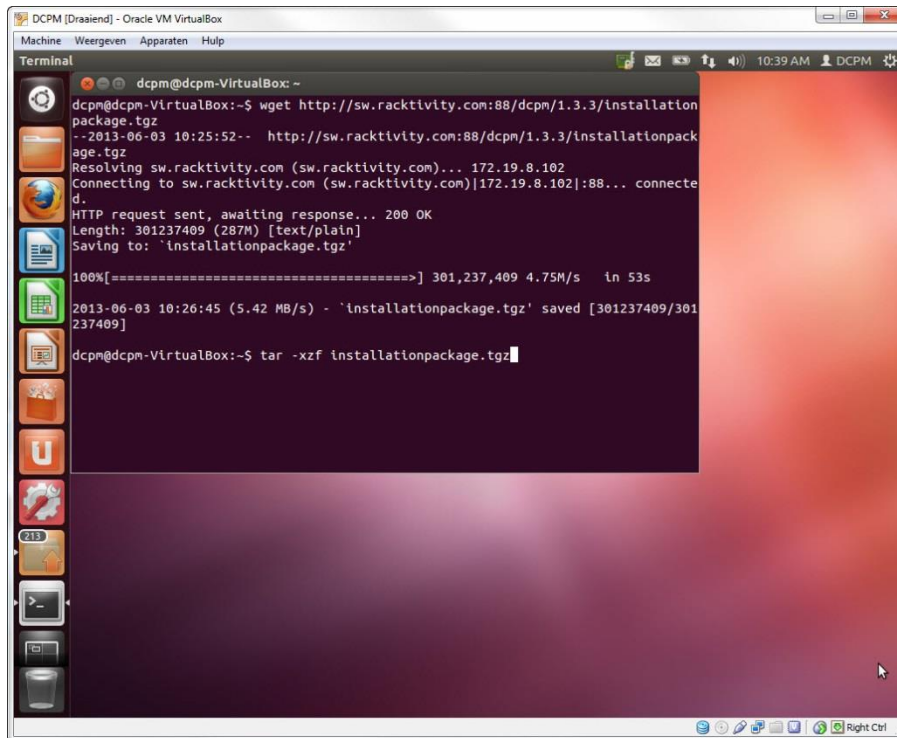
The installation starts

When the installation is completed you should have the following screen

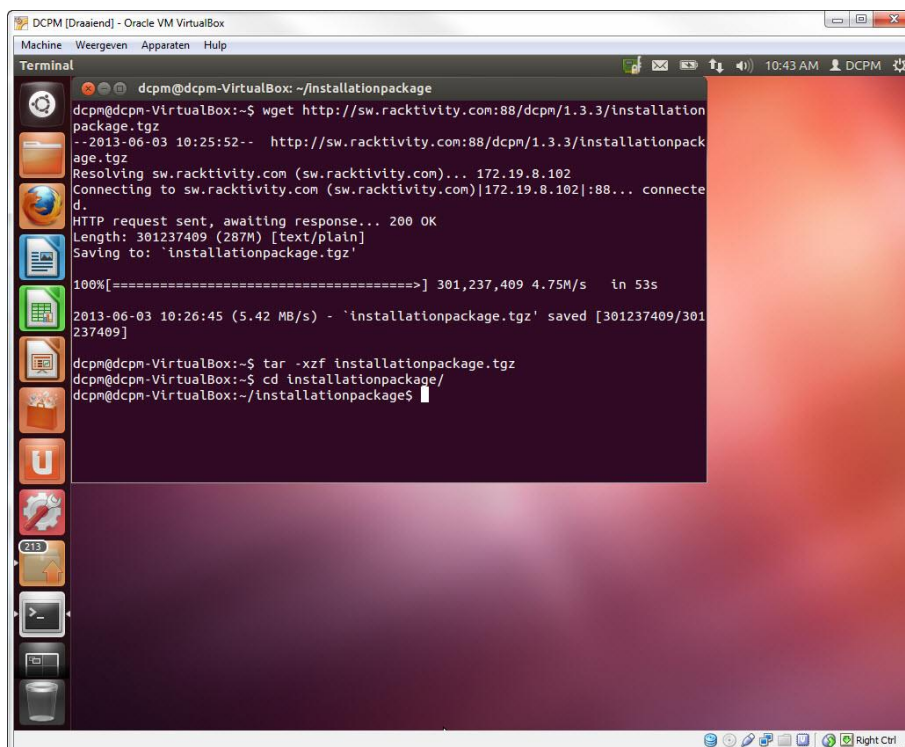


4. Unpack the installer by entering the following command:

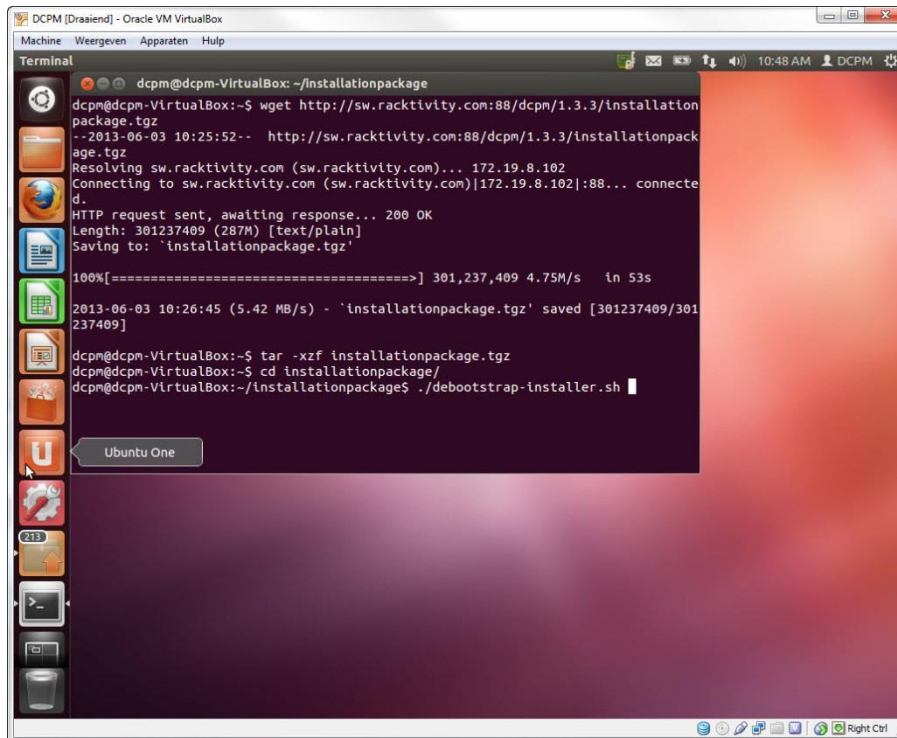
tar -xzf installationpackage.tgz



Type the following command
cd installationpackage/
press enter



5. Type the following command
./debootstrap-installer.sh



6. You will be asked to use an external database or the default internal database
 - a. External database: This database will be used for production, (database is stored on an external machine). Postgresql or oracle. (press 0)
 - b. Internal database: This database will be used for Demo purposes (all runs on one machine) (press 1)

Make your selection

IMPORTANT: you need 65GB of free space to install the internal Database!

Using external database you will be directed to the database setup wizard where you will be asked to complete the following items

- Type of external database: Postgresql or Oracle

Main database:

- IP address
- Port information
- Database name
- Login information of the database
- Password information of the database

Monitoring database: (can be the same information as the main database)

- IP address
- Port information
- Database name
- Login information of the database
- Password information of the database

```

Database setup wizard:
-----
Which type of external database are you using, Postgres (0) or Oracle (1)? [0] 0

DCPM main database setup:
-----
What is the ip address of the external database? [192.168.1.2] 192.168.1.4
What is the port of the external database? [5432] 5432
What is the name of the external database? [dcpm] dcpm
What is the login of the external database? [dcpm] dcpm
What is the password of the external database? [dcpm] 1234

Monitoring database setup:
-----
What is the ip address of the external database? [192.168.1.4] 192.168.1.4
What is the port of the external database? [5432] 5432
What is the name of the external database? [dcpm] dcpm
What is the login of the external database? [dcpm] 1234
What is the password of the external database? [1234] 1234

```

7. Prompt is displayed asking if you want to install a read only setup.

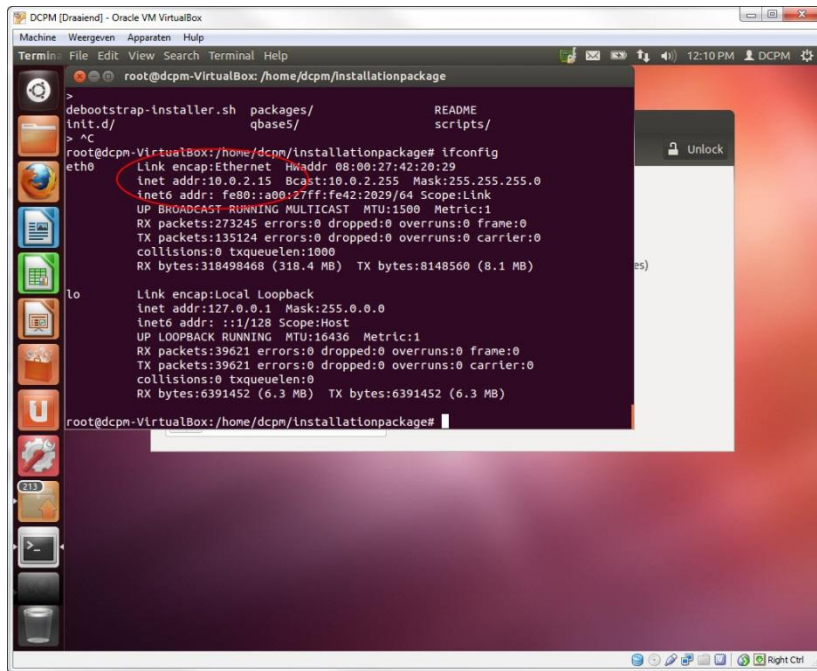
A read only set up is used when you want to install a blank DCPM system that will be used for uploading back up files into the read only systems. No monitoring is performed when installing DCPM as read only. Replications could be done to a read only system from a live system using its backup files. All changes done in the read only setup will not be replicated to the active system where you have downloaded the backup files from.

8. The installation will give an overview of what you selected.
Press: "Y" if the summary is correct

Installation will start.

9. Look for the IP address of your DCPM by adding the command

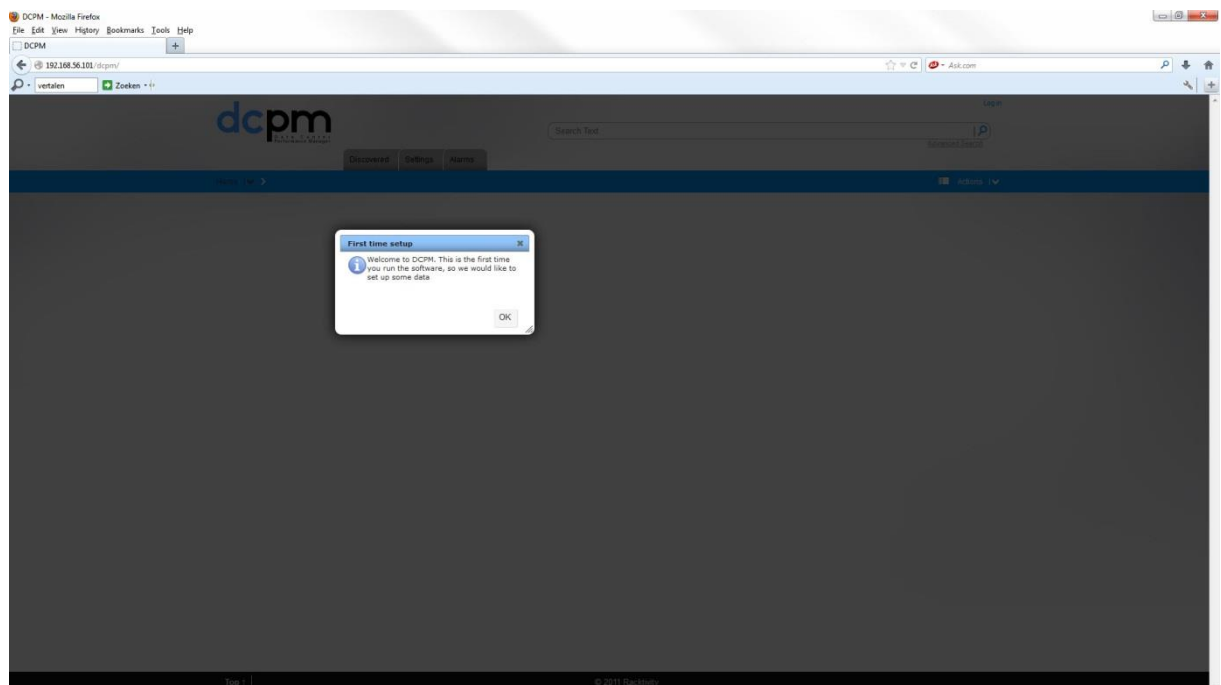
Ifconfig



10. Browse to the above ip address in your internet browser. Supported internet browser are:

- Mozilla Firefox
- Google Chrome

11. You will be directed to the install page of DCPM



Update from version 1.3.4 to version 1.3.5

In this section of the document we have added the procedure for upgrading the DCPM software **from version 1.3.4 to version 1.3.5**.

If an older version of DCPM is installed you need to make sure that you perform the upgrades per version, so from 1.3.2 to 1.3.3 to 1.3.4 to 1.3.5.

1. Log in on the machine where DCPM is installed and go to the terminal.
2. Log in as root.
3. Type "mkdir 1.3.5" to make a new directory
4. Type "cd 1.3.5"
5. Download the new installation package by adding the following command:
 - a. [wget http://downloads.test.rackactivity.com/dcpm/1.3.5/installationpackage.tgz](http://downloads.test.rackactivity.com/dcpm/1.3.5/installationpackage.tgz)
6. Follow steps 3 to 5 from the DCPM installation section
7. Question is asked by DCPM if you would like to upgrade. Press "Y"

Update from version 1.3.5 to version 1.4.0

In this section of the document we have added the procedure for upgrading the DCPM software **from version 1.3.5 to version 1.4**.

If an older version of DCPM is installed you need to make sure that you perform the upgrades per version, so from 1.3.2 to 1.3.3 to 1.3.4 to 1.3.5 and from 1.3.5 to 1.4.0

1. Log in on the machine where DCPM is installed and go to the terminal.
2. Log in as root.
3. Type "mkdir 1.4" to make a new directory
4. Type "cd 1.4"
5. Download the new installation package by adding the following command:
 - a. [wget http://downloads.test.rackactivity.com/dcpm/1.4.0/installationpackage.tgz](http://downloads.test.rackactivity.com/dcpm/1.4.0/installationpackage.tgz)
6. Follow steps 3 to 5 from the DCPM installation section
7. Question is asked by DCPM if you would like to upgrade. Press "Y"

Update from version 1.4.0 to version 1.5.0

In this section of the document we have added the procedure for upgrading the DCPM software **from version 1.4.0 to version 1.5.0**

If an older version of DCPM is installed you need to make sure that you perform the upgrades per version, so from 1.3.2 to 1.3.3 to 1.3.4 to 1.3.5 to 1.4.0 and from 1.4.0 to version 1.5.0

1. Log in on the machine where DCPM is installed and go to the terminal.
2. Log in as root.
3. Type "mkdir 1.5" to make a new directory
4. Type "cd 1.5"
5. Download the new installation package by adding the following command:
a. [wget http://downloads.test.rackactivity.com/dcpm/1.5.0/installationpackage.tgz](http://downloads.test.rackactivity.com/dcpm/1.5.0/installationpackage.tgz)
6. Follow steps 3 to 5 from the DCPM installation section
7. Question is asked by DCPM if you would like to upgrade. Press "Y"

Update from version 1.5.0 to version 1.5.1

In this section of the document we have added the procedure for upgrading the DCPM software **from version 1.5.0 to version 1.5.1**

If an older version of DCPM is installed you need to make sure that you perform the upgrades per version, so from 1.3.2 to 1.3.3 to 1.3.4 to 1.3.5 to 1.4.0 to 1.5.0 and from 1.5.0 to 1.5.1

1. Log in on the machine where DCPM is installed and go to the terminal.
2. Log in as root.
3. Type "mkdir 1.5" to make a new directory
4. Type "cd 1.5"
5. Download the new installation package by adding the following command:
a. [wget http://downloads.test.rackactivity.com/dcpm/1.5.1/installationpackage.tgz](http://downloads.test.rackactivity.com/dcpm/1.5.1/installationpackage.tgz)
6. Follow steps 3 to 5 from the DCPM installation section
7. Question is asked by DCPM if you would like to upgrade. Press "Y"

Uninstall DCPM older versions

Uninstalling DCPM is only applicable on the following software versions using an internal database:

- 1.1
- 1.2
- 1.3
- 1.3.1
- 1.3.2
- 1.3.3
- 1.3.4
- 1.3.5
- 1.4.0

1. Log in on the machine where DCPM is installed and go to the terminal.
2. Log in as root.
3. Type `"/etc/init.d/dcpm stop"` to Stop DCPM
4. Type `"rm -rf /srv/chroot/dcpm"` (or the installation path that you provided) to remove DCPM files
5. Type `"rm -f /etc/init.d/dcpm"` to remove the startup script.

Uninstall DCPM latest versions

Uninstalling DCPM is only applicable on the following software versions using an internal database:

- 1.3.4
- 1.3.5
- 1.4.0

1. Log in on the machine where DCPM is installed and go to the terminal.
2. Log in as root.
3. Type `"/etc/init.d/dcpm uninstall"` to uninstall DCPM

Configure a HTTPS access on DCPM

To generate a HTTPS access on DCPM below instructions need to be added in the root on the server terminal.

Make sure you are in the installation package folder of DCPM.

```
cp scripts/nginx-https-setup.py /srv/chroot/dcpm  
press enter
```

now type the following

```
chroot /srv/chroot/dcpm  
press enter
```

next is the following command:

```
python nginx-https-setup.py country=US state=Arizona city=Atlanta organization=Org unit=Unit  
domain=dcpm.com
```

where:

Country= your country name

State= State name

City= City name

Organization= organization name

Unit= company unit name (eg. Operations, Sales)

Domain= your domain name

Below a screen shot of the configuration.

```
[root@localhost installationpackage]# cp scripts/nginx-https-setup.py /srv/chroot/dcpm/  
[root@localhost installationpackage]# chroot /srv/chroot/dcpm/  
root@localhost:/# python nginx-https-setup.py country=BE state=East-Flanders city=Lochristi o  
rganization=Racktivity unit=Sales domain=dcpm.com  
Generating SSL certificate...  
Done  
Writing new configuration to disk  
Cleaning up nginx config  
Cleanup done  
Reloading Nginx server configuration...  
Nginx server configuration reloaded successfully.
```

First set up

1. When the DCPM installation is done you can browse to the IP address with your internet browser. Supported internet browsers are:
 - a. Mozilla Firefox
 - b. Google Chrome

DCPM states that it is the first time you run the software, you will be asked if you would like to set up some data. The initial set up is done in five steps

1. Company Name: here you need to add your Company Name as requested:



2. Contact Details and license key:



- **Contact details:** enter the DCPM contact person
- **Address:** Here you need to enter your company address
- **Email:** Here you enter the DCPM contact person email
- **Phone:** Contact phone number
- **Fax:** Contact person fax number
- **License Key:** In this field you should paste the license file delivered by Racktivity if applicable.

3. Set up SMTP information: This needs to be added if you want DCPM to send alerts to certain email addresses.

First setup - step 3/5

Please set up SMTP (mail) information

SMTP Server
Host or host:port for SMTP connection

SMTP Login
login for SMTP authentication

SMTP Password
password for SMTP authentication

Global Sender/From
Originating email address (e.g. noreply@rackactivity.com)

Global Receiver/to
This address will receive system emails

Submit Cancel

4. Set up SNMP (v2) information

First setup - step 4/5

Please set up SNMP (v2) information

SNMP Hosts that will receive traps from DCPM:

First SNMP Host **SNMP Port** **Community String**

Second SNMP Host **SNMP Port** **Community String**

Third SNMP Host **SNMP Port** **Community String**

Trap routing and system keep-alive
Traps will be sent to hosts declared above

☐ Send keep alive messages from DCPM system

☐ Rethrow traps received from devices

System keep alives interval *
The period (in minutes 1-15) between system keep alives

SNMP Hosts that will be set on monitored hardware:
This should represent the ip of the dcpm installation. Change at your own risk!

First SNMP Host **Second SNMP Host**

☒ Change IPs on monitored hardware

Submit Cancel

5. General set up

First setup - step 5/5

Country **Timezone**

Currency
Currency used in the system

Temperature
Measurement unit used for showing temperature

☒ Celsius ☐ Fahrenheit

Discovery interval *
Period (in minutes) between discovery cycles. Min. 30

Daily backup hours
Hours when backup will start, leave empty to turn off

Automatic hardware change detection
☐ Activate Hardware Checks

Time Format
Format to show date and time

Grace period *
Period (in minutes) when new alarm is not raised again after manual acknowledge

Alarm flood protection delay period *
Delay (in seconds) after which alarm can change its state. Flood prevention

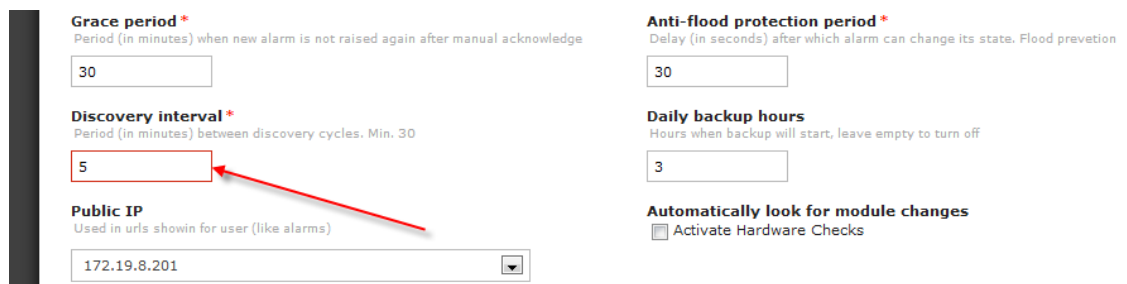
Public host
Used in urls showed for user (like alarms)

Preferred protocol
☒ http ☐ https

Submit Cancel

A detailed explanation of the preferences can be found in [section "Administration - Settings"](#) in the DCPM user manual

In case of an error in the set up data, the system will highlight the error when trying to submit the changes:



The screenshot shows a configuration page with several fields. A red box highlights the 'Discovery interval' field, which contains the value '5'. A red arrow points from this box to the 'Public IP' field, which contains the value '172.19.8.201'. Other fields include 'Grace period' (30), 'Anti-flood protection period' (30), 'Daily backup hours' (3), and 'Automatically look for module changes' (checked). The 'Discovery interval' field has a red border and a red arrow pointing to it from the 'Public IP' field.

Correct the errors and finalize the set up data.

Should you not have a proper license key, the system can be configured and will be organized in evaluation mode. The evaluation mode allows a connection of maximum 2 devices. All other functionalities will be available.

6. Log in into your DCPM

The default login credentials for your DCPM instance:

- Login: **admin**
- Password: **1234**

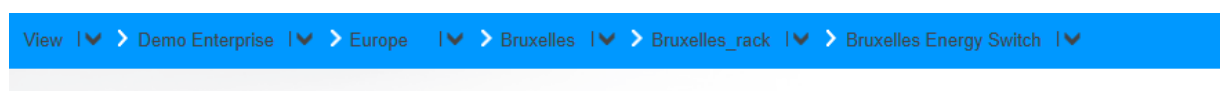
Please change these as soon as possible.

Initial Setup

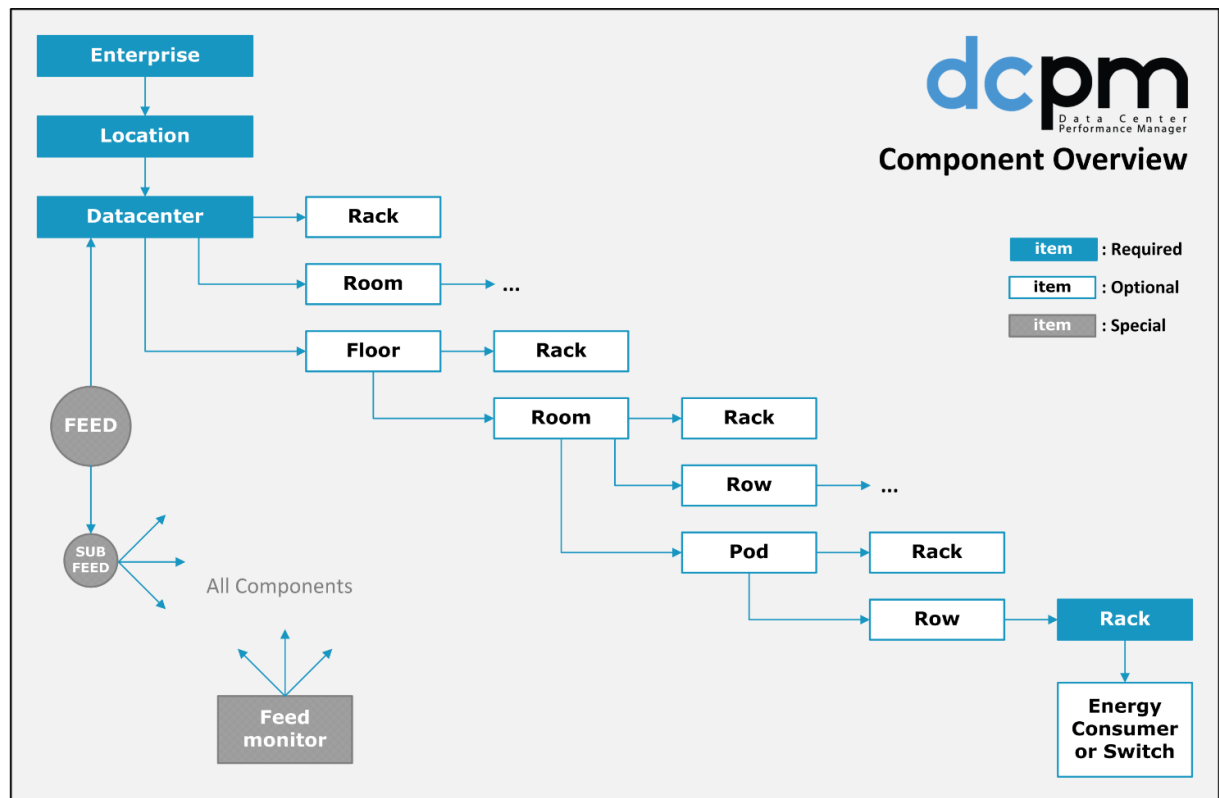
After installing DCPM, the only available component in the navigation Space is Enterprise. Before populating the system with ENERGYSWITCHs and other devices it is advised to add the necessary components similar to your actual infrastructure.

Components

Components are the basic elements DCPM uses to structure your organization and depict the logical drill down of IT assets. The components can be found in the View Space.



From top to bottom, DCPM contains the following Components:



At least the following Components need to be defined before DCPM can be populated with devices (pictured in blue in the picture above):

- **Enterprise:** Every DCPM instance has 1 Enterprise that defines your organization. It cannot be deleted.
- **Location:** Geographical location or region of the Components below.
- **Datacenter:** Datacenter in which the Components below are located.
- **Rack:** The rack in which the devices are mounted.

Optional Components (pictured in white in the picture above):

- **Floor**
- **Room**
- **Pod**
- **Row**

Special Components (pictured in grey in the picture above):

- **Feed:** is implemented on datacenter level and shows the incoming power. Used for capacity planning. Example: Define maximum capacity per feed, sub-feed... Feeds can be extended with sub-feeds resulting in a more elaborate feed tree. Feed information can be retrieved on the datacenter level.
- **Feed monitor**
A feed monitor can be various types of feed monitoring systems whereby we measure the incoming power or feed usage accurately for better capacity planning. The feed monitor can be added to all levels including and below component **Datacenter**.

- **Energy consumer**

The energy consumer is available on rack level and monitors output in the rack. It behaves like an EnergySwitch.

See section Energy Consumer for detailed information on set up and usage.

Notes:

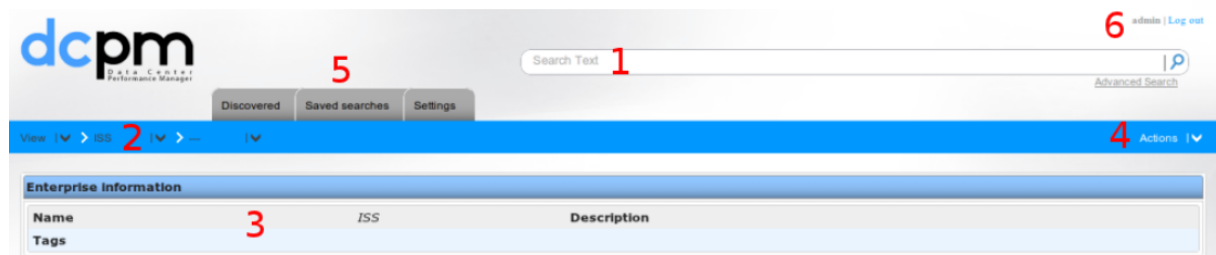
- The maximum number of possible levels is 8.
- A parent can house many children (i.e.: multiple floors in 1 datacenter), but the children cannot be of a different type.
Example: When you have created a floor in a datacenter, you can't create a room as child under that same datacenter. The created room will be automatically moved as a child of the floor.
So when you have an existing datacenter with only 4 rooms and you want to add a floor, the first floor created will automatically house the 4 existing rooms. The second floor you add will be blank.
- A rack is the lowest and only component that can contain devices (EnergySwitches or energy consumers).

DCPM Navigation

The DCPM main navigation is based on breadcrumbs. A breadcrumb navigation (or “breadcrumb trail”) is a type of **secondary navigation scheme** that reveals the user’s location in an application. We use this type of navigation to support the hierarchical structures of the datacenters.

Main window

Most screens within DCPM are based on the same layout, as described below:



1. **Search box**

Search the entire system for a specific string. Click **Advanced Search** for more options.

2. **Navigation pane – breadcrumb style**

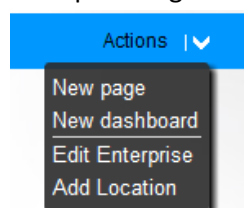
This area shows your current location in the Enterprise. Move your mouse over the different components to see more options and levels.

3. **Details pane**

Content of the current Page.

4. **Actions menu**

Shows the possible actions for your current location. For example, if you are on the Enterprise Page the Action menu shows following options:



5. **Bookmarks section**

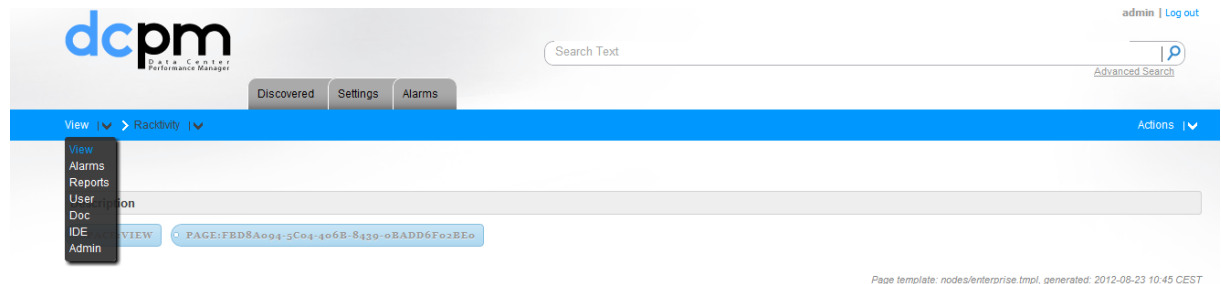
Shortcuts to Pages in a specific Space that are visible to all users. Bookmarks can be changed by the administrator in the Admin Space (Settings > General).

6. **Log out**

Interface

Spaces

A Space is a logical group of pages and can be found on the left side of the navigation bar. Hold your cursor over the “View” icon in the navigation pane to see the full list. Click the space to see the content.



By default the following spaces are available to the user:

- **View**
Shows the structure of your organization with all monitoring data.
- **Alarms**
Shows all data related to alarms (operator panel, history...)
- **Reports**
Displays reports for your infrastructure.
- **User**
Shows the available dashboards and gives option to add and edit dashboards
- **Doc**
DCPM documentation.
- **IDE**
Integrated development environment where you can customize templates, widgets, ...
- **Admin**
Administration contains the **settings** page.

Spaces can be created and maintained by an administrator in the **settings** page. This page is accessible via the **Admin** space.

Pages

Pages are the representation of the available content. Pages for Components are created using templates and contain predefined content relevant to that type of Component. These templates can be edited in the IDE Space.

To create a Page, hold your cursor over the Actions item in the navigation pane and select New Page. Pages use the wiki markdown syntax, described here:



Remark: newly created pages cannot be visualized if they are not linked to the parent **home** in the user space.

Bookmarks

Upon set up of DCPM, 3 bookmarks are available

- Discovered
- Settings
- Alarms

The bookmarks can be adapted via the settings page in [the Admin space](#).

Detailed browsing in DCPM

This section describes:

- What data is available on page and space level
- How you can access data in DCPM
- How you can easily find data in DCPM

Clicking on the DCPM logo brings you to the main enterprise level. From here you can start browsing through the different spaces and pages.

Tags & Labels

Almost all Spaces, Pages and components, have the option to attach Tags and Labels (optionally).

Tag

A tag is a combination of a **tag name** and a **value**. It is defined by the user and used in search results, reporting and formulas.


Example: you can group EnergySwitches using a certain tag and afterwards it is possible to do reporting of the power based on this tag:

Label

A label is a string used in search results.

Search function in DCPM

Simple Search

The image shows a simple search interface. At the top right, there is a link 'admin | Log out'. Below it is a search bar with the placeholder text 'Search Text' and a magnifying glass icon. To the right of the search bar is a link 'Advanced Search'.

In the Simple mode DCPM returns all the pages that contain the searched words in the title, labels or their content.

Advanced Search

The image shows an advanced search interface. At the top right, there is a link 'admin | Log out'. Below it are three search fields: 'Title:' with a text box containing 'PageTitle', 'Labels:' with a text box containing 'label, label', and 'Search:' with a text box containing 'Search Text'. To the right of the 'Search:' field is a magnifying glass icon and a link 'Simple Search'.

In the Advanced mode DCPM gives you three possibilities to look up information. You have these three search fields at your disposal:

- Title

By entering data in the Title box, DCPM looks up for matching page titles or object names in its database. Matching pages are displayed as you type, which make it very user-friendly. For example, searching for 'Home' will return all the pages that have the title Home.

- Labels

You can also search using tags and labels. Currently, when a page is created, a default tag is given.

For example: space:space_name; where space_name is the name of the space that the page belongs to.

The objects also get default tags.

For example, since all this documentation pages belong to the 'Doc' space, searching for 'Doc' returns all the pages in the space since they were all assigned that tag during creation. Searching for 'floor' will return the pages of all the floor objects.

NOTE: The Label search field is comma separated, which means you can search for several tags and labels at the same time in order to narrow down your search results.

- Search

The **Search** field is a search field as any other search; whatever you write will be searched for in all the pages. For example, if you search for the word 'create', all the pages that contain that word are displayed.

Admin Space: Administration - Settings

The page **Settings** contains the administration data. The page is bookmarked
The page is divided in sections with specific information or administration options

Settings

SMTP settings

- SMTP server settings
- SMTP login credentials
- Global receiver: address that will receive messages and information out of DCPM
- Global sender: address from which information out of DCPM is sent.

When the SMTP settings are changed the admin user should receive an email message from DCPM stating that email settings are changed (available as from version 1.4.0)

SNMP settings

- SNMP information
- Keep alive interval and preferences
- SNMP host data and port data
- SNMP trap Host information

Setting preferences

The preferences are set at enterprise level and can be changed at all times via the settings panel.

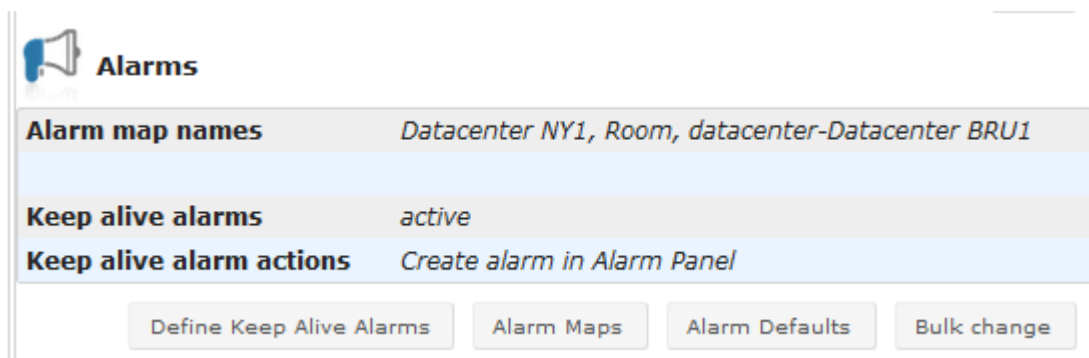
- Default country
The default is taken from the enterprise set up. You can change the default on datacenter level. When set it will supersede the settings of the enterprise level.
- Default time zone: see default country
- Temperature
Choose Fahrenheit or Celsius
- Time format
To identify the correct time format for date and time
 - European 2000-01-31 24:00 CET
 - American 24H 01/31/2000 24:00
 - American 12H 01/31/2000 12:00
- Manual acknowledge grace period

This is the period in minutes (default 30) to identify the period when a new alarm should not be raised after that a previous alarm had been acknowledged by a user.

- Anti-flood protection delay
This is the delay in seconds (default 30) set to prevent continuous alarms on state changes.
- Autodiscovery interval
This is the period in minutes (default 30) between discovery cycles.
- Automatic hardware change detection
Activate this option to look for potential hardware configuration changes.
Example: when an Energy Sensor is added to the configuration of the ENERGYSWITCH, the system will automatically adapt this in the DCPM system.
- Daily back up time (hour)
Daily time a backup is launched. Leave the cell empty to turn off the back up creation.
- Public IP address

Setting Alarms

In this part of the settings, the user is able to define keep alive alarms on its installed equipment. Racktivity devices have a keep alarm function installed. The keep alarm function of the Racktivity devices are sending a heartbeat to DCPM. If the heartbeat is not available any more DCPM will create an alarm in the alarm panel.



| Alarms | |
|--------------------------|--|
| Alarm map names | Datacenter NY1, Room, datacenter-Datacenter BRU1 |
| Keep alive alarms | active |
| Keep alive alarm actions | Create alarm in Alarm Panel |

Define Keep Alive Alarms Alarm Maps Alarm Defaults Bulk change

Press Define keep Alive Alarms to edit the keep alive alarm definition. And activate by pressing the activate button.

Edit keep-alive alarm definition

Keep alive settings
☐ Activate keep-alive alarms on monitored equipment

Action that should take place:
☒ Create alarm in Alarm Panel
☐ Send SNMP trap
☐ Send an email
☐ Create internal event
for advanced users, you have to prepare code to handle internal event.
☐ Text message (SMS)

Severity level Critical

Next
Cancel

When activation the keep alarm function the wizard will provide the option to change the subject field of the keep alarm message.

Contact Information

- General contact information

UI Settings

This section is only available as from DCPM version 1.4.0.

The UI information can be used to set up some standard credentials in DCPM when implementing devices or hardware.



Pressing the Edit wizard defaults will able the user to configure his standard credentials and SNMP information. Those standard credentials and SNMP information will be used when the user is configuring devices.

Default account credentials

Rackactivity hardware
Read user
This account is used for reading values from the device

Admin user
This account is used for changing settings on the device

SNMP hardware
Read community string

Password
Password for read user

Password
Password for admin user

Write community string

Pressing the Hide common messages button will show below list of messages that should be disabled when using DCPM. Default all messages will be presented by DCPM when performing actions. Messages that are selected in this box will not appear any more when using DCPM.

Hide confirmation messages

Informational message boxes
Choose which messages should not be presented

☐ Enterprise saved
☐ Location saved
☐ Location deleted
☐ Datacenter saved
☐ Datacenter deleted
☐ Feed saved
☐ Feed deleted
☐ Floor saved
☐ Floor deleted
☐ Room saved
☐ Room deleted
☐ Pod saved
☐ Pod deleted
☐ Row saved
☐ Row deleted
☐ Rack saved
☐ Rack deleted
☐ Energy Switch saved
☐ Energy Switch deleted
☐ Feed Monitor saved

☐ Feed Monitor deleted
☐ Energy Consumer saved
☐ Energy Consumer deleted
☐ Device saved
☐ Device deleted
☐ Map saved
☐ Map deleted
☐ Schematics saved
☐ Schematics deleted
☐ E² saved
☐ User alarm saved
☐ User alarm deleted
☐ Outlet(s) powered off
☐ Outlet(s) powered on
☐ Outlet parameters have been saved
☐ Device reboot command sent
☐ Device shutdown command sent
☐ Alarm bulk change finished
☐ FTP password updated
☐ Regeneration of pages started

System maintenance

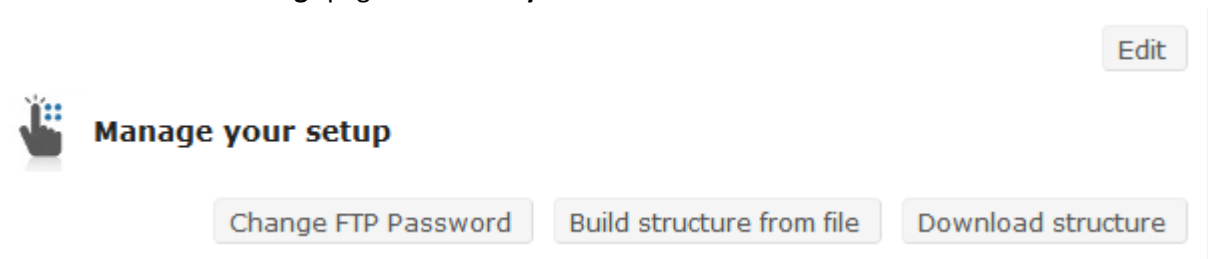
Retention

- *Days to keep RAW data*
Number of days where the data is stored on a five minute interval, this is not an average of the previous five minutes but real time information.
- *Days to keep daily collapsed data*
This is the min, max, average data of the days
- *Months to keep monthly collapsed data*
This is the min, max, average data of the previous months
- *Days to keep archived alarms*

Manage your setup

DCPM provides the option to upload and download a datacenter structure.

- Go to the **settings** page in section **system maintenance**.



There are 2 options:

- Build a structure from file via the structure builder wizard

Structure builder

+ Add file...

Please upload the file containing the structure.

☐ Remove previously created objects before creating the new structure.

☒ If elements with the same name are found only the new properties should be applied.

Submit

Cancel

The file is downloaded as .txt format and can be opened via wordpad. The file is created according to following rules: components names are followed by its assigned name:

```

1 Enterprise: JSL Racktivity
2   Location: Lochristi
3   Datacenter: Office
4   Feed: Test feed
5   Type: WIND
6   Emission: 3.0
7   Capacity: 100.0
8   Rack: table
9   IP: 192.168.14.88, 192.168.14.160, 192.168.14.11, 192.168.14.99
10  Port: 161
11  String: public
12  Pdu: APC 0PDU-192.168.14.11
13    IP: 192.168.14.11
14    Port: 161
15  Pdu: ES1008-16I-192.168.14.160
16    IP: 192.168.14.160
17    Port: 443
18  Pdu: RaritanPDU-192.168.14.99
19    IP: 192.168.14.99
20    Port: 161
21  Pdu: Sentry Switched CDU Version 6.0c-192.168.14.88
22    IP: 192.168.14.88
23    Port: 161
24

```

Properties need to be identified with corresponding values

- Download structure
In case a structure is already set up, it is possible to download this structure and adapt before uploading again via previous function.

General information

This section outlines the DCPM version and license version. In case no license is available, an evaluation version is active. To change the license key, select the option **change license** and add the license key.

Configuration

Map editor

The purpose of map editor is to create maps for different objects (datacenters, rooms etc.). For each object, values for different attributes can be shown on the map.

The map editor macro has six buttons on its top-right corner.



The buttons are from left to right:

- Add image - used to upload a new map image
- New - used to create a new map
- Edit - change the map name and select a different map image
- Save - saves the map properties
- Load - load a different map in the editor
- Delete image/map

Create maps

Uploading a new map file

To upload a new map file:

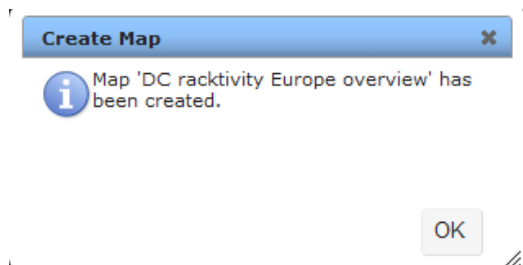
- Click on 'Add image' mark from the top-right corner of the map editor.
- Select **Add file** and to the required image
- Select the image and wait till the image is uploaded

Creating a new map

To create a new map:

1. Click on 'New' mark from the top-right corner of the map editor.
2. A wizard is displayed. Fill in the name of the map.

3. Select one of the available map files then click 'Submit'.



Assign map

- To assign the map to an existing object:
Select the object type from the 'Object type' drop down list.

Available object types are:

Component type: Location

Component:

Untitled

- Location
- Datacenter
- Floor
- Room
- Pod
- Row
- Rack
- Device
- Energy Switch
- Feed
- E² Sensor
- Feed monitor, Energy consumer

- Fill in the name of the created component in the 'component' text box. You will notice that a list of objects is displayed beneath the 'Object' text box while you type. After an object is selected, a list of attribute names is displayed in the upper section of the map editor.

Object type: Datacenter

Object: datacenter

| | | | | | |
|------------|----------------|---------|--------------|---------------|-----------------|
| DC Voltage | Apparent Power | CO2 | Active Power | Active Energy | Apparent Energy |
| Current | Frequency | Voltage | DC Power | DC Current | Power Factor |

- (available as from DCPM version 1.4.0) When you have selected the component you will be able to select input, output or formula information.

Input: Data measured by a feed monitor

Output: Data measured by an energy consumer

Formula: A list of formulas that were made will be presented. The outcome of this formula will be presented on the map where you have dragged the formula on.

Component type: Location

Component: Belgium

Data source: Output Input Formula

- Add attributes to the new map. New attributes can be easily added on the map by dragging them from the upper section of the map editor in to the map.

| | | | |
|--|------------|----------------|--|
| Object type: <input type="text" value="Datacenter"/> | DC Voltage | Apparent Power | |
| Object: <input type="text" value="datacenter"/> | Current | Frequency | |

Europe

- Saving the map configuration
To save the map configuration click on the 'Save' mark from the top-right corner of the page.

View maps

To view a map with detailed information, add the map editor macro on a dedicated page.
The map editor macro can be found in DCPM advanced – macros –List of predefined Macros

Formula editor



This section describes the Formula editor available from Settings page.
The purpose of Formula editor is to create calculations on measured values.

Prior of having the possibility of performing calculations you will need to add tags on AC² Lines, Energy switch outlets or on your structure.

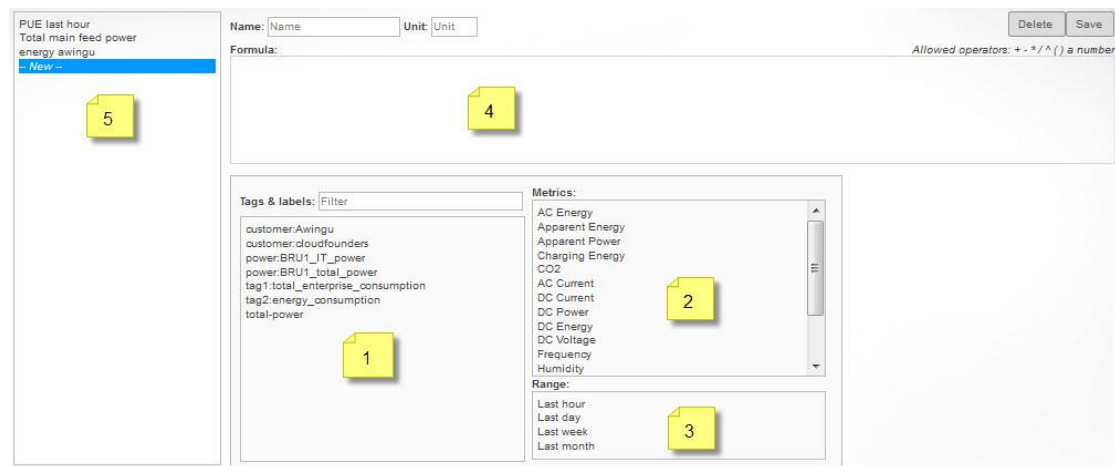
Tag can be added by editing your structure, or energy monitoring device. A tag needs to be added in the following format:

Tag1:value1,tag2:value2,....

When adding tags you are not allowed to use spaces.
Different tags need to be separated by a comma.



When selecting the Editor in the settings bookmark you will be directed to the editor:



Five Boxes are presented in the editor:

1. Presentation of the tags assigned in DCPM
2. Metrics box to select the metric type on which you would like to create a formula
3. Time range for the data
4. Formula overview box
5. Formula names that were created.

Create new formula:

Press the new button located in Box 5 on the above picture.

Provide the name and unit for your formula value by adding this information on the top boxes next to Name and unit.

Creating a formula is done by following the steps as follow:

1. Select you tag in box 1

2. Select your metric in box 2
3. Select your time range in box 3
4. Select your operator for the calculation, Allowed operators are + - * / ^ () a number
5. Select again your tag in box 1
6. Select your metric in box 2
7. Select your time range in box 3
8.

Now your formula can be saved by clicking the save button in the top right corner.

Presenting your formula value on a template:

To present the formula on a template you will need to add the following html code in the IDE space:

```
[[formula:guid=$object.guid, formula=Formula name/]]
```

Schematics editor

Use the schematics editor to create a schematic representation of your DC and rack structure or part of your structure.

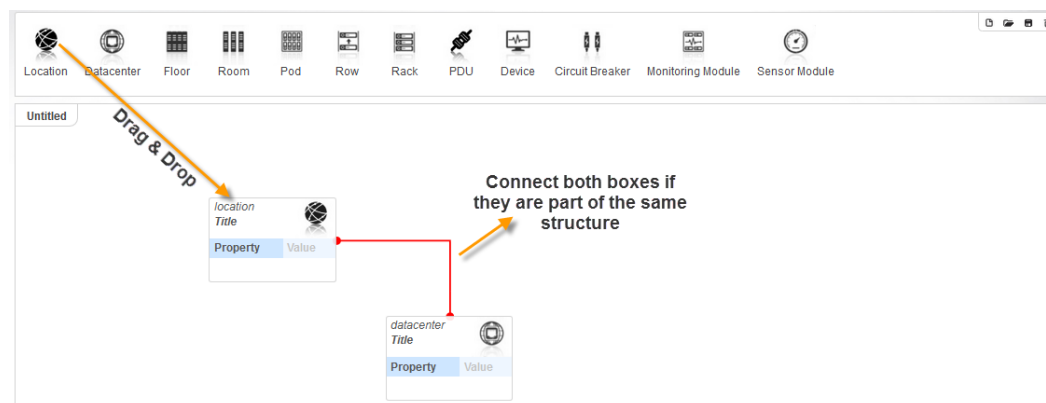
The user can create a schematic overview of the structure or part of the structure by using drag and drop.

On the top right corner of the tab you have 4 different icons:

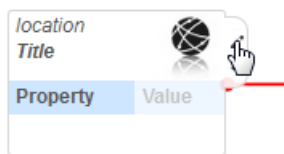
(from left to right)

- Create new scheme
- Load scheme
- Save scheme
- Delete scheme

Create new schematic



Add corresponding object and values:



Press the edit button to perform the following actions:

- change the Title of the structure box
- Assign an object of the selected structure type
- Assign a value to present in the scheme

Presentation of the scheme in DCPM

Presentation of the scheme can be done by creating a page with a macro. The macro to use is described in the macro section.

Firmware update/upgrade

Use this link to update the firmware of one or multiple connected Racktivity devices.

| Name | Type | Firmware version | Parent | Datacenter |
|---------------------------|---------------|------------------|--------------|-----------------|
| ES1008-161-192.168.14.234 | Energy Switch | 1.2.1.10 | BRU1_rack 01 | Datacenter BRU1 |
| ES1008-161-172.19.45.4 | Energy Switch | 1.2.0.6 | BRU1_rack 02 | Datacenter BRU1 |
| ES2024-16-172.19.45.3 | Energy Switch | 1.2.0.6 | BRU1_rack 03 | Datacenter BRU1 |
| ES2024-32-172.19.45.11 | Energy Switch | 1.2.0.6 | BRU1_rack 04 | Datacenter BRU1 |
| ES2024-16-172.19.45.2 | Energy Switch | 1.2.0.6 | BRU1_rack 05 | Datacenter BRU1 |

1. Press the "upload file" button to upload your latest firmware received by Racktivity support.
2. Select the firmware file from the upgrade file drop down list.
3. Select one or more Racktivity devices from the list.
4. Click on "Upgrade selected EnergySwitches" button to start the upgrade.
5. A confirmation dialog is displayed. Click OK to continue.

You will notice that the upgrade progress is logged on this page.

The upgrade process could take a while to complete depending on the number of EnergySwitches to be upgraded and the speed of the network connection.

Upgrade process has started!
We started upgrading the firmware of the pdu 10.130.254.100 with the file Energy_Switch_v1.2_1U.rup at 2012/03/29 09:45:38
For the pdu 10.130.254.100 using the firmware file Energy_Switch_v1.2_1U.rup the module M1 has been upgraded to version 1.2.0.6 at 2012/03/29 09:47:52
For the pdu 10.130.254.100 using the firmware file Energy_Switch_v1.2_1U.rup the module P1 has been upgraded to version 1.2.0.7 at 2012/03/29 09:47:53
For the pdu 10.130.254.100 using the firmware file Energy_Switch_v1.2_1U.rup the website has been updated at 2012/03/29 09:47:53
The upgrading firmware process ended 2012/03/29 09:47:53.

Administration - User Management

After the initial setup of DCPM, there is only one user available to access the application. With the user management you can add users and define their user rights.

To access the user management, go to the **settings** page. In the General section, click User and permission management.

Two tables appear: Users and Groups.

The screenshot shows the DCPM (Data Center Performance Manager) administration interface. At the top, there's a header with the DCPM logo, a search bar, and navigation tabs for 'Discovered', 'Settings', and 'Alarms'. The 'Settings' tab is active, and the 'Users' sub-tab is selected. Below the header, there are two main panels: 'Users' and 'Groups'. The 'Users' panel contains a table with columns 'Name', 'Rename', 'Change Password', and 'Remove'. It lists 'Anonymous User' and 'Admin User'. Below the table is an 'Add User' button. The 'Groups' panel contains a similar table with columns 'Name', 'Rename', and 'Remove', listing 'Admins', 'Public Group', and 'Users'. Below this table is an 'Add Group' button. The top right corner shows the user 'admin' and a 'Log out' link.

Add a user

To add a new user, click the button **Add**. A form appears to fill out the user credentials.

The screenshot shows a modal window titled 'Add user' with a close button (X). It contains three input fields: 'Login:', 'Password:', and 'Name:'. The 'Password:' field is highlighted with a blue border. At the bottom of the form are two buttons: 'Add' and 'Cancel'.

Fill out the user data and click Add. The user appears in the list.

Changing User Passwords

To change the password of a user, click **Change Password** next to the concerned user. A form appears to change the password.

Change password of Admin User ✕

Password:

Change

Cancel

Enter a new password and click Change. The password is updated. The new password must be applied upon the *next* login of the user.

Removing a User

To remove a user, click Remove next to the user. A confirmation window appears.

Remove John Doe ✕

⚠ Are you sure you want to remove user "John Doe"?

Remove

Cancel

Click Remove to confirm the removal of the user. The user permissions are immediately revoked. If the user has an open session, he is no longer able to perform new actions.

Creating a Group

To create a new group, click Add Group. A form appears to fill out the group credentials.

Add group ✕

Name:

Add

Cancel

Provide a group name and click Add. The group appears in the list.

Renaming a Group

To rename a group, click the name of a group. The details of the group are expanded. Click Rename to rename the group. A form appears to rename the group.

Rename Users ✕

Name:

Update the group name and click Rename. The group name is updated.

Adding a User to Groups

To add a user to a group, click the name of a user. The list of groups, to which the user belongs, appears.

Users

| Name | | | |
|--------------------------------|------------------------|---------------------------------|------------------------|
| Anonymous User | Rename | Change Password | Remove |
| Admin User | Rename | Change Password | Remove |
| John Doe | Rename | Change Password | Remove |

| Group Name | Remove |
|--------------|------------------------|
| Public Group | Remove |
| Users | Remove |

Add to group

Add User

Click Add to group. A form appears with the list of available groups.

Add user John Doe to a group ✕

Select to group to which you want to add the user and click Add. The selected group appears in the list of groups.

The user must restart his session to apply the changes.

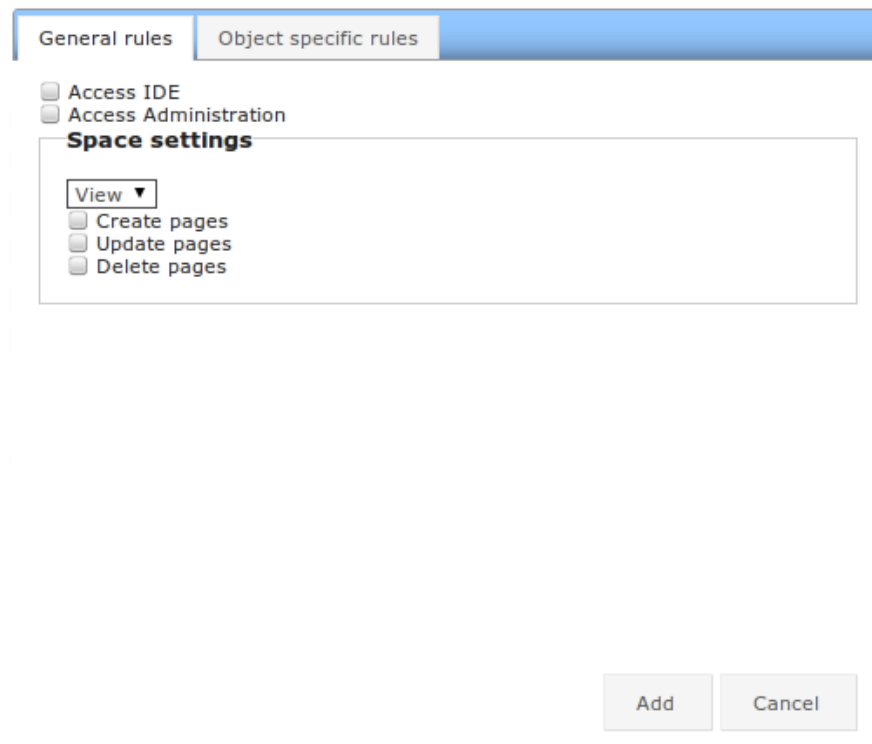
Assigning Rules for a Group

To create a rule for a group, click the name of a group for which you want to create a rule. The details of the group are expanded.

Click Assign rule, a form appears with a list of rules.

There are two types of rules: **general rules** and **object specific rules**.

In the general rules section you can permit or deny access to IDE and Administration spaces. Also, permissions for creating, editing and deleting pages can be set in this section.



The screenshot shows a web interface with two tabs: 'General rules' (active) and 'Object specific rules'. Under 'General rules', there are two checkboxes: 'Access IDE' and 'Access Administration'. Below these is a section titled 'Space settings' which contains a 'View' dropdown menu and three checkboxes: 'Create pages', 'Update pages', and 'Delete pages'. At the bottom right of the form are 'Add' and 'Cancel' buttons.

In the Object specific rules section you can set different permissions for different objects.

In order to set permissions for a specific object, you first have to select it from list.

Note that you have many objects configured not all of them will be shown in that list. In this case, to select an object you have to search it first by typing its name into the search box. As you type its name, the search results will update every second so that you can find objects even if you don't know their complete names.

General rules | Object specific rules

rack

- rack: Rack2
- rack: Rack3
- rack: Rack1

☐ View
☐ Update
☐ Perform actions
☐ Set these rules on all children

Warning: the settings only get saved when the "Add" button is pressed.

Add Cancel

Click Add to assign the rule to the group. Repeat this to assign more rules to the group.

Revoking a Rule in a Group

To revoke a rule in a group click the name of a group for which you want to revoke a rule. The details of the group are expanded. Click Revoke next to the rule that you want to revoke. A confirmation window appears.

Revoke Access IDE from Admins

⚠ Are you sure you want to revoke rule "Access IDE" from group "Admins"?

Revoke Cancel

Click Revoke to confirm the removal of the rule from the group. The rule is immediately revoked and disappears from the list of rules.

Removing a Group

To remove a group, click Remove next to the group that your want to remove. A confirmation window appears.

Remove Users

⚠ Are you sure you want to remove group "Users"?

Remove
Cancel

Click Remove to confirm the removal of the group.

Bookmarks management

Manage the bookmarks section.

Admin > Settings > Bookmarks

Bookmarks

| | Bookmark | URL | Rename | Delete |
|----|------------|------------------------------|--------|--------|
| \$ | Discovered | #/Admin/Discovered | edit | delete |
| \$ | Settings | #/Admin/Settings | edit | delete |
| \$ | Alarms | #/Alarms/AlarmsOperatorPanel | edit | delete |

Add bookmark

The user can add a bookmark by pressing the “Add bookmark” button.

In the new pop up screen you need to add the URL and the name of your bookmark.

Add bookmark

Name

Url

Save

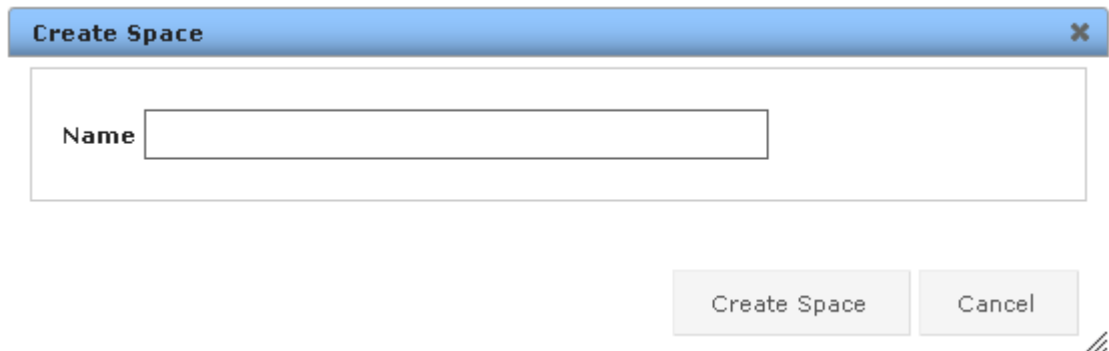
Cancel

Space management

Create a Space

To be able to create a new space in DCPM, the Group you are part of needs to have the 'Access Administration' [right](#) assigned.

- Select the **Admin** space from the upper left dropdown menu.
- Click on **Space management**.
- Click on **Create New Space** and a form will appear to create a space.

A dialog box titled "Create Space" with a close button (X) in the top right corner. Inside the dialog, there is a label "Name" followed by a text input field. At the bottom right of the dialog, there are two buttons: "Create Space" and "Cancel".

Create Space


Name

Create Space Cancel

- Provide a **Name** for the space and click **Create Space**. The new space will appear in the list of spaces.
- Use this section also to rename spaces or change their order by drag and drop.

Delete a Space

- To be able to delete a space in DCPM, the Group you are part of needs to have the 'Access Administration' [right](#) assigned. To delete a new space:
- Select the **Admin** space from the upper left dropdown menu.
- Click on the **delete** button from the line on which the space you want to delete is and a form will appear to create a space.
- Click on **OK** to confirm the removal.

A dialog box titled "Delete Space" with a close button (X) in the top right corner. Below the title bar, it asks "Are you sure you want to delete **View** space?". Below this is a yellow warning box containing the text: "Deleting a space will delete all the pages in that space. There is noway to restore it back, so an "export" is advised." At the bottom right, there are two buttons: "Ok" and "Cancel".

Delete Space

Are you sure you want to delete **View** space?

Deleting a space will delete all the pages in that space. There is noway to restore it back, so an "export" is advised.

Ok Cancel

Important notice:

Deleting a space will delete all the pages in that space. There is no way to restore it back.

Rename a space

To be able to rename a space in DCPM, the Group you are part of needs to have the 'Access Administration' rights assigned.

- Select the **Admin** space from the upper left dropdown menu.
- Click on the rename button from the line on which the space you want to rename is.

- Provide a new name for the space and click Rename Space.

Edit Space

Name

View_New

Rename Space

Cancel

Change page lay out

You can edit page templates via the IDE normally the same way as any other files or by clicking "Edit Templates"

When the templates are modified, you can regenerate the pages by clicking "Generate Pages".



Change pages layout

You can edit page templates via the IDE normally the same way as any other files or by clicking "Edit Templates"
When the templates are modified, you can regenerate the pages by clicking "Generate Pages".

Edit Templates

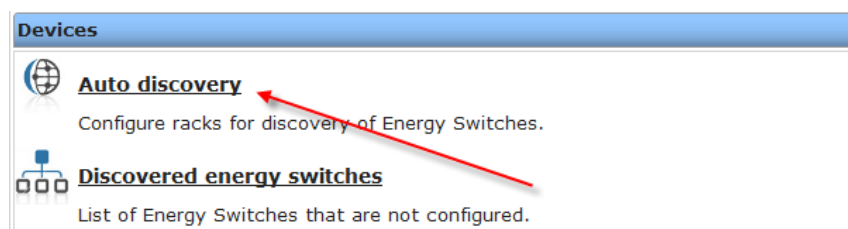
Generate Pages

Devices

This section describes how to handle Racktivity and third party hardware.

Autodiscovery

In order to check whether all racks have the correct IP ranges or to immediately discover the required Energy Switches, go to the **Settings** page, section **Devices**, option **Auto discovery**.



Selecting this option will give you a list of all racks with available IP addresses. You can select the button **Discover** to start an immediate auto discovery. This way you are not forced to wait until discovery based on the interval period.

| Auto discovery | | | |
|----------------|----------------|----------|------|
| Rack | Ip Address | | |
| KDP | 192.168.14.117 | Discover | Edit |
| Rackivity | | Discover | Edit |

Page 1 of 1

Remark: In case the IP address is empty you can use function button **edit** to configure the autodiscovery.

Configure EnergySwitches

Select the device in the list and click button **Configure**.

A wizard will be displayed asking for following information:

- Credential data
 - Name of the EnergySwitch
 - Read user = can only read data
Important: This is the read user defined to the EnergySwitch
 - Admin User = can manage the EnergySwitch
Important: This is the admin user defined to the EnergySwitch
 - API port – if not taken automatically

Note: for non Rackivity devices this wizard will be used to set the SNMP configuration.

- Attach power feed: select the power feed to which this EnergySwitch belongs.

Submit the wizard to complete the configuration. This will bring you to the page of the configured EnergySwitch.

New data is checked and updated every 5 minutes, starting from the hour.

In case Rackivity Energy Sensors are attached and administrated by the configured EnergySwitch, the sensor will be automatically be added as an element of the EnergySwitch.

Discovered EnergySwitches

All the discovered power distribution units (from Rackivity, Raritan, APC...) are created in the system as **EnergySwitch**.

They can be visualized via the **Settings** page, section **Devices**, under **Discovered EnergySwitches** or via the bookmarked page **Discovered**.

The list shows all discovered **not configured** devices.

Unconnected hardware

List of Energy Switches, Energy Consumers or Feed monitors that are not connected to feeds.
Created devices

| Unconnected Energy Switches | | |
|-----------------------------|------------------------|---|
| Datacenter | Rack | Device |
| Vilvoorde 1 | Rack A | DCMU 8port-172.19.16.35 |

All monitored hardware

List of all Energy Switches, Energy consumers and Feed monitors.

Created devices

List of devices created in DCPM

Unconfigured devices

This section provides a list of devices that are not configured for monitoring.

Alarm definitions

This section presents a complete overview of all alarms made in DCPM.

Miscellaneous

View documentation

This provides a link to the DCPM user manual

View audit logs

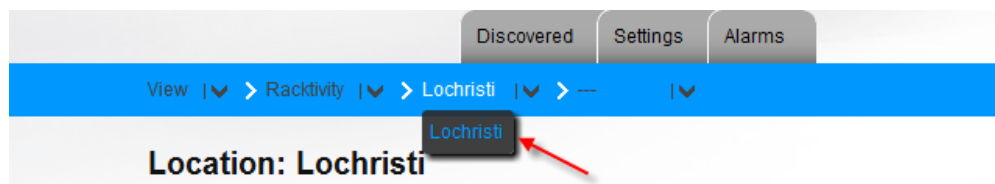
In this section the user can view all logs performed by its users

Contact us

Via this section the user can sent an email directly to DCPM support. This can be used for reporting bugs or feature requests.

View Space

The **view** space contains all pages with the existing datacenter levels (location-datacenter-room-floor-rack...). Via the breadcrumb style navigation you can roll out the datacenter structure. Scroll over the navigation pane and select the corresponding page.



Following data can be read from the various levels:

Enterprise level: total power AC/DC

Location level: total power AC/DC, power consumption of lower level datacenter with feed information (capacity), user defined alarms

Datacenter level: total power AC/DC and CO2 footprint efficiency , detailed power metrics AC/DC, AC/DC graphs of voltage, current, power and power factor, direct link to lower levels (called children), user defined alarms.

Floor, Room, row and pod level: detailed power metrics AC/DC, AC/DC graphs of voltage, current, power and power factor, direct link to lower levels (called children), user defined alarms.

Rack level: detailed power metrics AC/DC, AC/DC graphs of voltage, current, power and power factor, direct link to lower levels (called children), user defined alarms.

The **direct children** section on rack level shows all connected EnergySwitches, Energy Sensors and devices. Click on one of the children to access the detailed data.

Example:



Manual creation of a structure

The following Components can be added manually to your DCPM instance. Once created, a Component can be edited by navigating to the applicable Page and selecting Edit in the Actions menu.

Enterprise

Enterprise is the default Component enabled in DCPM and represents the top of the Component hierarchy.

- Use the Action menu to edit and rename to your organization. Give this Component your specific enterprise name.

Location

A location represents the geographical location of the Components below it.

To add a location to the Enterprise:

- Move the cursor over the Actions menu in the navigation pane and select “Add Location”.
- The “Create a Location” wizard appears. Fill in the necessary fields and click Submit.
- A confirmation window appears, click OK.
- The location appears as child of the Enterprise Component in the navigation pane. Select it by moving your cursor over the Location breadcrumb and clicking the appropriate item.

Note: The data and graphics will not be filled with data until DCPM is also populated with EnergySwitches.

Datacenter

A location can have 1 or more physical datacenter buildings.

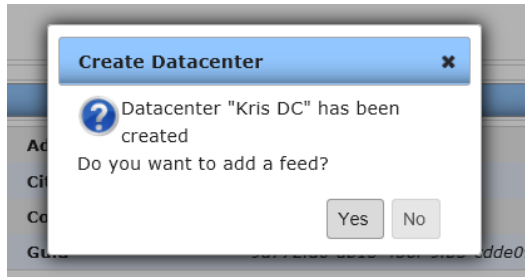
To add a datacenter to a location:

- Navigate to the location Page using the navigation pane.
- Move the cursor over the Actions menu in the navigation pane and select “Add Datacenter”.

- The “Create Datacenter” wizard appears. Fill in the necessary fields on both tabs (including time zone as this will enable correct time information on graphs and reports) and click Submit.

Add a feed

- The system will prompt a message to add a feed

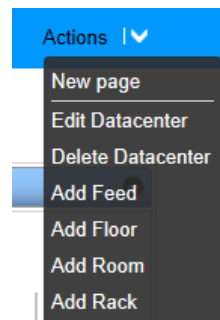


Assign a feed in case you want to measure the incoming power distributed over your datacenter. All feed options and possibilities are available in section [feed](#).

A feed can be defined later via the actions menu.

- A confirmation window appears, click OK.
- The datacenter appears as child of the location Component in the navigation pane. Select it by moving your cursor over the datacenter breadcrumb and clicking the appropriate item.

Once a datacenter has been successfully added you have the option of adding **floors**, **rooms** and **racks** to your cursor over the Actions menu.



added you have the option datacenter by moving the

Floor

Floors are physical layers in a datacenter; it is possible that your datacenter building has more than one floor.

To add a floor to a datacenter:

- Navigate to the datacenter Page using the navigation pane.
- Move the cursor over the Actions menu in the navigation pane and select “Add Floor”.
- The “Create Floor” wizard appears. Fill in the necessary fields and click Submit.
- A confirmation window appears, click OK.
- The floor appears as child of the datacenter Component in the navigation pane. Select it by moving your cursor over the Datacenter breadcrumb and clicking the appropriate item.

Note: Once a floor has been created, the "Add Room" item will disappear from the Actions menu of its parent datacenter Page. Since a parent can only have children of the same type the “Add Room” has now moved to the Action menu of the floor Page.

Room

Depending on the layout of the datacenter, a floor can be one big room by itself, or it can be divided in multiple rooms.

Note: A room can be added to a datacenter or a floor (but not both).

To add a room:

- Navigate to the parent Page using the navigation pane.
- Move the cursor over the Actions menu in the navigation pane and select “Add Room”.
- The “Create Room” wizard appears. Fill in the necessary fields and click Submit.
- A confirmation window appears, click OK.

The room appears as child of its parent component in the navigation pane. Select the room level by moving your cursor over the parent’ breadcrumb and click the appropriate item.

Pod

A pod is a part of a datacenter room for easy extension of your space.

To add a pod to a room:

- Navigate to the room Page using the navigation pane.
- Move the cursor over the Actions menu in the navigation pane and select “Add Pod”.
- The “Create Pod” wizard appears. Fill in the necessary fields and click Submit.
- A confirmation window appears, click OK.
- The Pod appears as child of the room Component in the navigation pane. Select it by moving your cursor over the parent’ breadcrumb and clicking the appropriate item.

Row

The racks that house your servers will most likely be setup in rows.

To add a row:

- Navigate to the parent Page using the navigation pane.
- Move the cursor over the Actions menu in the navigation pane and select “Add Row”.
- The “Create Row” wizard appears. Fill in the necessary fields and click Submit.
- A confirmation window appears, click OK.
- The Row appears as child of its parent Component in the navigation pane. Select it by moving your cursor over the parent’ breadcrumb and clicking the appropriate item.

Rack

Racks are the cabinets that house your servers and ENERGYSWITCHs. The rack Component can be added to almost all other Components and represents the bottom of the Component hierarchy.

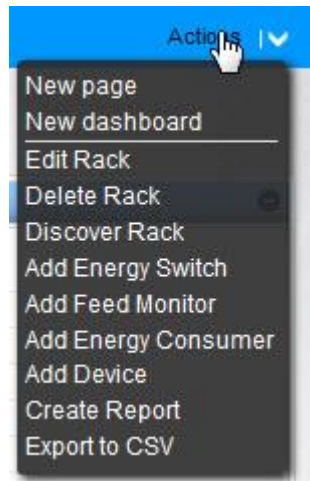
To add a rack:

- Navigate to the parent Page using the navigation pane.

- Move the cursor over the Actions menu in the navigation pane and select “Add Rack”.

The “Create Rack” wizard appears. Fill in the necessary fields (optionally set the automatic discovery options (IP addresses or ranges) on the Auto Discovery tab) and click Submit.

When the rack is created the user has the option of performing following actions directly in the rack:



Edit Rack: Change the Rack name, rack type, rack position, add some description for the rack, add a tag and/or Label. A second tab in this section is used to perform an auto discovery of energy switches.

Delete Rack: This to delete a rack and its connected components.

Discover Rack: Start discovery of a rack. Note: To start Rack discovery the user should enter an IP address or range. To add an IP address or range follow the instructions explained in the Auto discovery section of this document.

Add Energy Switch: Quick “add Energy Switch” is only available as from version 1.4.0. By clicking this button the user will be able to set the Energy switch IP address, Port information and community string. Energy Switches are measuring OUTPUT power.

Add Feed monitor: Link for adding a new feed monitor. A feed monitor measures INPUT power!

Add Energy consumer: Link for adding a new energy consumer. A energy consumer measures OUTPUT power!

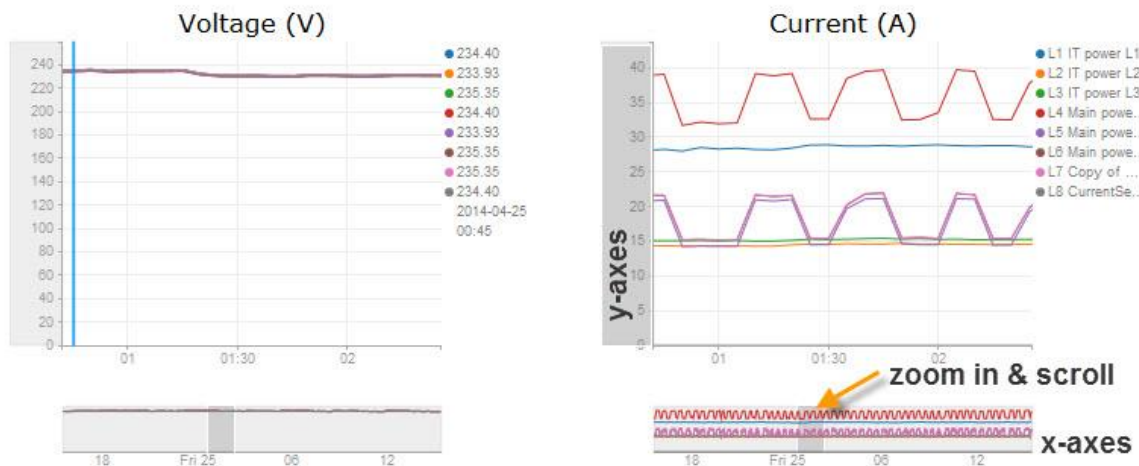
Add device: A device can be put in the rack and can group several outlets. Adding a device is typically user to investigate detailed power consumption of devices installed in an Rack.

Create Report: To create a report of the rack or its direct children. (Daily average, mininum and maximum for the selected period)

Export to CSV: This link can be used to download the five minute interval data from the DCPM database over the selected period of time.

Graphs presented in the structure

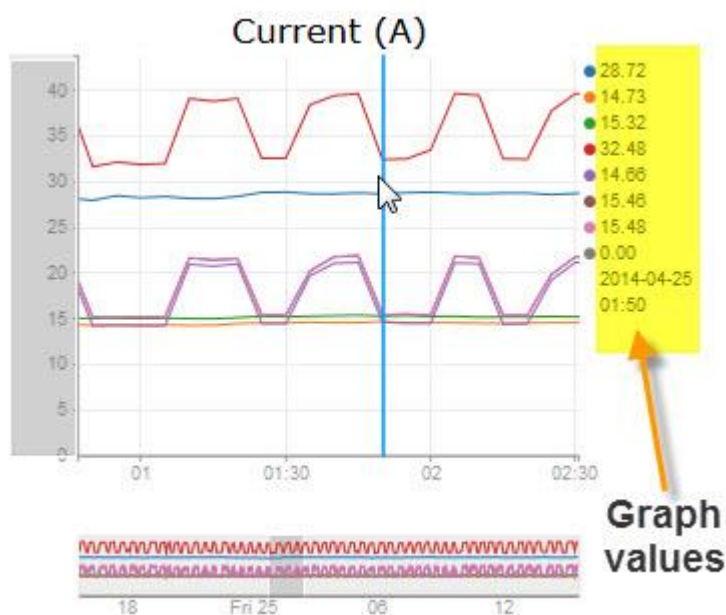
When creating an datacenter, floor, room, pod, rack DCPM will present graphs in the standard template. Values on those graphs are output values measured by configured energy consumers. When the user installs a feed monitor graphs will present input power for the feed monitor. Graphs will always present the aggregated data of its direct children. At the lowest part of the configured structure you will find the data gathered by the energy consumer in detail.



For a detailed view directly on the graph the user has the ability of zooming in on the x-axes of the presented graph. As from DCPM version 1.4.0 all presented graphs are synchronized if zooming is done.

As from version 1.4.0 following additional actions can be performed:

- Zoom in on the y-axes
- Automatically update of the presented graphs are done every five minutes
- Values on graph are presented when hovering over the graph



Feed

A feed is the representation of the incoming power. We identify the feeds on **datacenter** level.
To create a feed:

- Navigate datacenter page and add feed via actions menu
- Identify the feed name and capacity (A)
- Submit

When a feed is created, it becomes available on datacenter level. Creating or editing the feed presents a new pop screen with 3 sub tabs

- Edit Feed
- Additional parameters
- Cost Calculation

Edit feed | Additional Parameters | Cost Calculation

Name *
L1_main

Capacity (A) *
Maximum 30000 A
125

Type of current *
choose between AC and DC
☒ Alternating current
☐ Direct current

Feed reference voltage *
voltage available on this feed
230

Feed type *
Predefined or custom type
Generic

CO2 emission (g/kWh) *
Editable only for custom type
217.00

Submit **Cancel**

Edit Feed

In this tab the user needs to complete the following information:

- Feed name
- Feed Capacity in Amps
- Type of Current: AC or DC
- Feed Reference voltage
- Feed type: Type of energy used for the facility, This information will be calculation the CO2 emission

Additional parameters

In this subtab the user can enter a feed description, a tag (used in formulas) and Label (used in the search field).

Cost calculation

In the tab cost calculation the user is able to enter the power cost of the energy used. There are several possibilities for entering the following cost:

- Monthly subscription Fee
- Cost (per kWh)

The user has the possibility to select:

- **Flat Fee:** Cost is used as is, no variables are set in the cost.
- **Hourly changes (per kWh):** User can set different costs per hour.

Edit feedAdditional ParametersCost Calculation

Cost calculation is based on a few components - subscription monthly fee and cost per kWh. Please input necessary parameters. All values should be provided in system's currency, which is set to Euro.

Monthly subscription

Cost (per kWh)

0

0.15

In case costs vary in time, please provide additional information

☐ flat fee

☒ hourly changes (per kWh)

☐ weekday changes (per kWh)

| | | | |
|----------------------|----------------------|----------------------|----------------------|
| 0 - 1 | 1 - 2 | 2 - 3 | 3 - 4 |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 4 - 5 | 5 - 6 | 6 - 7 | 7 - 8 |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 8 - 9 | 9 - 10 | 10 - 11 | 11 - 12 |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 12 - 13 | 13 - 14 | 14 - 15 | 15 - 16 |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 16 - 17 | 17 - 18 | 18 - 19 | 19 - 20 |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 20 - 21 | 21 - 22 | 22 - 23 | 23 - 24 |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |

Submit

Cancel

- **Daily changes:** Cost is changing per full day this is settable by the user per day.

Sub-feeds

Feeds can be extended with sub-feeds according to the feed structure within your datacenter.

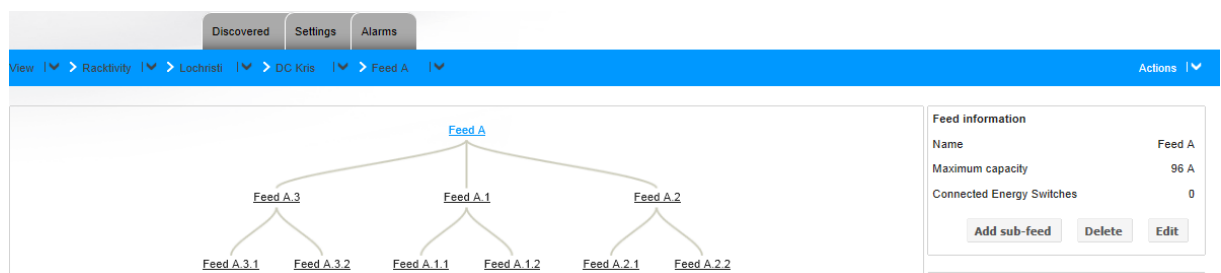
Sub- feeds can be connected with a specific level of your structure to represent the physical structure.

- Go to the feed page and select the sub-feed.

- Select **edit feed**

- Select the appropriate component level (always below datacenter level as this level is represented by the main feed)
- Submit

The result is a feed structure as shown in example below:



Feed information

The info of the feeds is centralized on location level. The power usage is coming from the EnergySwitches connected to the feeds. The total capacity is coming from the feed itself.

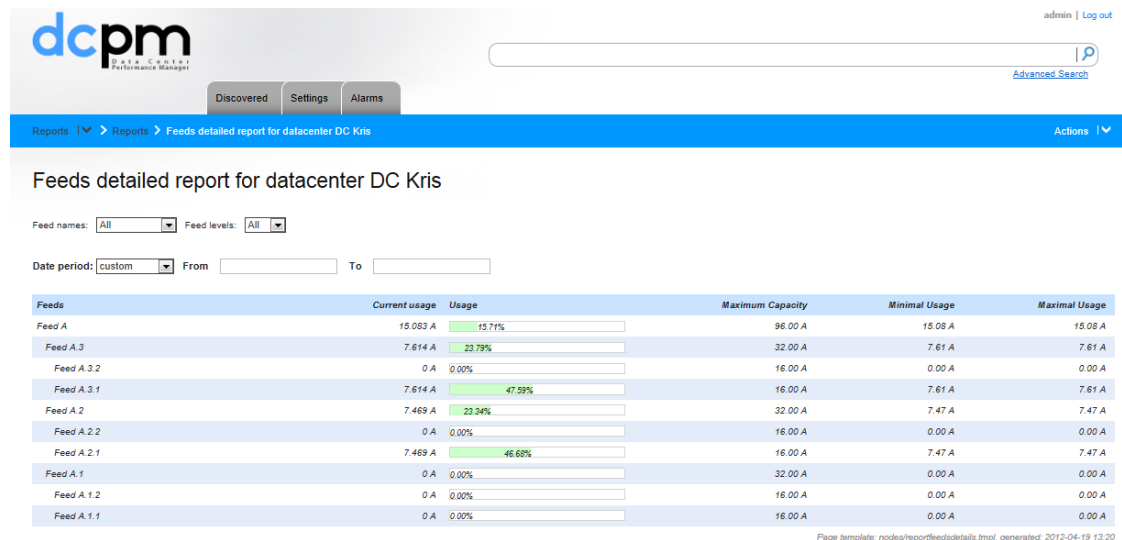
Location: Brussel

| Total Power for Vilvoorde 1 | | Total Power for Vilvoorde 2 | |
|-----------------------------|----------|-----------------------------|-------|
| Total AC Power: | 1.723 kW | Total AC Power: | 0.0 W |
| Total DC Power: | 0.0 W | Total DC Power: | 0.0 W |
| more... | | more... | |

| Power consumption information | | | |
|-------------------------------|-------------|--------|------------------|
| Feeds | Power usage | Usage | Maximum Capacity |
| Vilvoorde 1 | | | |
| Feed A | 1100.80 W | 15.64% | 7040.00 W |
| Feed B | 622.20 W | 8.84% | 7040.00 W |

A graphical representation of the feed usage – capacity usage can be found in the standard report templates.

Feeds can be monitored using the device type **feed monitor**. See section [feed monitor](#) for more info.



Delete components

Components of the structure can be deleted. As a result **all** information of the lower levels will be erased.

Deleting part of the structure can be done through the action button.

The **enterprise** level cannot be deleted!

Access device WebGUI

DCPM provides the user with two options to access configured device web GUI's.

On Device page

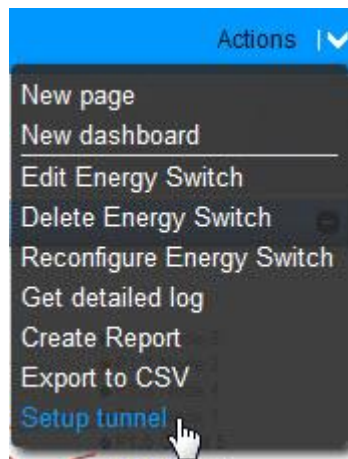
When the user drills down his structure up to the device level and wants to see the device web GUI he can scroll down the page and click on the Web UI link at the bottom left. Clicking this button will open a new tab in the web browser directing to the device IP address.

| Name | Type | Rackactivity |
|---|---|--------------|
| API | ES1008-161-192.168.14.231 https://192.168.14.231:443 | E² sensors |
| TYPE:ENERGYSWITCH PARENT:FDC3A350-9C60-4790-800A-F073E3E3E0E | | |
| Web UI Link to device web UI | | |

Page template: nodes/pdu.html generated: 2014-04-24 11:14 CEST

Via Tunneling

Setting up a tunnel to a device in DCPM is used when the user is not able to connect to the device due to network restrictions. This function is only available as from DCPM version 1.4.0. Setting up a tunnel can be done by going to the device in DCPM, click on the action button and select, setup tunnel. When setting up a tunnel DCPM will use the DCPM IP and set up a specific port to that device.



A new wizard will pop up for configuration of the tunnel.

To create a tunnel you should select the option to connect through http:// or through https://.

REMARK: Standard Rackactivity products are connecting over https:// so you should connect to port 443

When submitting the tunnel you can paste the presented URL in the web browser for direct connection to the device.

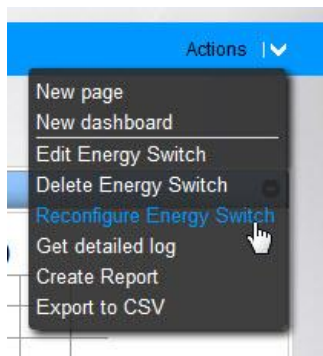
Edit & Reconfigure Energy Switches

When you have created your complete structure, it is possible to fill this structure with all available EnergySwitches and devices that will bring information into DCPM.

In this section we will explain how to find and configure EnergySwitches in your network.

EnergySwitch set up

Reconfigure EnergySwitches



Whenever new modules like Energy sensor have been added to the EnergySwitch, these modules can be integrated in the DCPM via a reconfiguration of the ES. This way you are not losing any historical data.

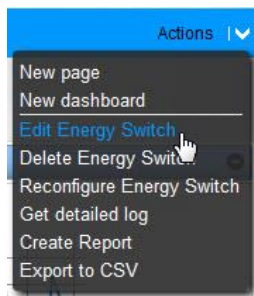
Vice versa, in case an Energy sensor is disconnected from the EnergySwitch, a reconfiguration will delete the data from DCP.

To reconfigure the energy switch you need to go to the energy switch in DCPM and press the Reconfigure Energy Switch under the action button.

When pressing the reconfiguration button DCPM will perform 4 steps

- Scanning for hardware changes
- Discover changes
- Reconfiguring Energy Switch
- Set up SNMP trap receivers

Edit Energy Switch



DCPM allows the user to edit the Energy switches that are installed. To edit the energy switch you need to go to the energy switch in DCPM and press the “Edit Energy Switch” under the action button.

Pressing this button will open a new window containing several bookmarks:

- Edit energy Switch
- Configure
- Lines
- Additional Parameters

Edit Energy switch

Under this section DCPM allows the user to:

- Change the device name
- Add a power feed to the device
- Add Tags (used for Formulas)
- Add labels

Configure the Energy Switch

Under this section DCPM allows the user to:

- Change the device IP address
- Change the port
- Update account information for admin and guest user.

Additional monitoring

This section describes the possibilities of using **devices** and **monitoring modules** within DCPM.

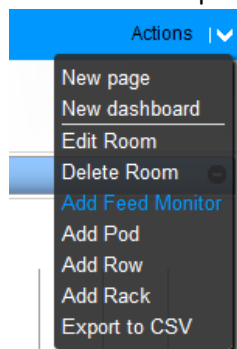
Feed monitor

A feed monitor can be various types of feed monitoring systems whereby we measure the incoming power or feed usage accurately for better capacity planning.

The feed monitor can be added to all levels including and below component **Datacenter**.

Create Feed monitor

- Select the option from the actions menu.



- Complete wizard (1/2)

Create Feed Monitor (1/2)

Name *

☐ Sync name to device ☐ Retrieve name from device

Description

Product type *

Module ID not needed

IP Address *

API Port *

Tags
Enter tags in the form of tag1:value1,tag2:value2

Labels
Enter labels as comma separated values e.g. label1,label2

Read user *
Account for reading values from the device

Password *
Password for read user

Admin user *
Account for changing settings on the device

Password *
Password for admin user

In order to add the feed monitor to your DCPM application, you have to enter the following values in the 'create feed monitor' wizard:

Name: Define a name for your feed monitor.

Sync Option: Synchronization of names from DCPM to device or visa versa (available as from version 1.4.0)

Product Type: Select the product type of the feed monitor you would like to add.

Available product types are:

- Rackactivity AC²
- Rackactivity DC²
- APC ATS
- Clever ATS
- CONTREL
- Delta UPS
- Delta Rectifier
- Eaton UPS
- Efore Ractifier
- Generic UPS
- SOCOMEC Diris range

Module ID: Enter the internal Modbus slave ID from the device. Should always be a unique numeric value.

IP address: Enter the IP address of your device

API Port: Enter the API port of your device. By default you should use '443'.

Complete the wizard by entering the device login IDs and corresponding passwords.
When adding a DC²Sensor to your DCPM module, you will need to complete the additional permission data requested in order to connect your device to DCPM.
Once completed, the wizard guides you to step 2 where you are asked to define the corresponding feed data, in case a feed is defined.

Create feed monitor (2/2)

Power feed Line Line 1 *
The feed providing the power for Line Line 1
IT phase 1

Power feed Line Line 3 *
The feed providing the power for Line Line 3
IT phase 3

Power feed Line Line 5 *
The feed providing the power for Line Line 5
non IT phase 2

Power feed Line Line 7 *
The feed providing the power for Line Line 7

Power feed Line Line 2 *
The feed providing the power for Line Line 2
IT phase 2

Power feed Line Line 4 *
The feed providing the power for Line Line 4
non IT phase 1

Power feed Line Line 6 *
The feed providing the power for Line Line 6
non IT phase 3

Power feed Line Line 8 *
The feed providing the power for Line Line 8

Submit Cancel

By measuring the incoming power versus the output power, it is possible to identify the power usage efficiency.

Identify Feed monitor

The feed monitor module can be located as direct child on the connected level.

| Direct Children | |
|------------------------------|--------------|
| Name | Type |
| Feed Monitor | Feed Monitor |
| Laboratory | Rack |

Click on the link to go to the feed monitor page and view the respective feed data = what the feed monitor is measuring.

Energy Consumer

An Energy consumer in DCPM is a device that will monitor the output of a connected load. It behaves as a normal EnergySwitch, will be part of the total aggregated measurement data and can be of any type.

Currently following types are foreseen in DCPM:

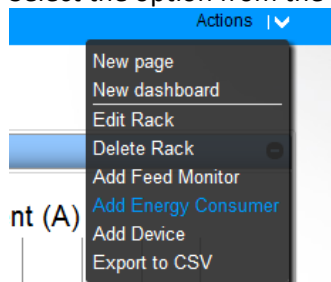
- Racktivity AC2 Meter
- Racktivity DC2 Meter
- APC: ATS
- Clever ATS
- Contrel
- Delta UPS
- Delta rectifier
- Eaton UPS
- Efore Rectifier
- Generic UPS
- Socomec Diris

Create Energy consumer

Like an EnergySwitch, an energy consumer is added **on rack level** in the datacenter structure in DCPM.

It can measure output power of devices not connected to EnergySwitches.

- Select the option from the actions menu



- Complete data of wizard page (1/2)

Create energy consumer (1/2)

Name *
Delta rectifier

Description

Product type *
Delta rectifier

Module ID *
1

IP Address *
192.168.14.241

API Port *
161

Tags
Enter tags in the form of tag1:value1,tag2:value2

Labels
Enter labels as comma separated values e.g. label1,label2

Read community string *
public

Write community string *
private

Submit Cancel

Submit to go to wizard page (2/2)

- Attach the consumer to the correct feed (like an EnergySwitch)

The feed information of the energy consumer is used to calculate the feed capacity.

Edit energy consumer (1/2)

Power feed *
The feed providing the power
Main feed

Submit Cancel

As a result, the power information can be read and is used to calculate capacity of the assigned feed.

| DC metrics | |
|-----------------|-----------------------|
| Parameter | Value |
| Measure time | 2012-09-21 15:00 CEST |
| DC Voltage | 53.50 V |
| DC Current | 0.00 A |
| DC Power | 0.00 W |
| DC Energy | 11.00 kWh |
| Charging Energy | --- |

HINT! In case the feed is not using data from the energy consumer, review whether you have selected the correct type of current (AC or DC) when identifying the feed.

Devices

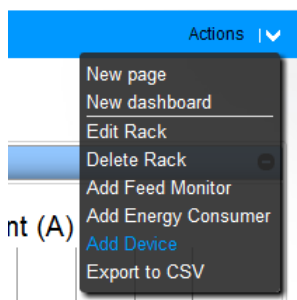
A device can be any type of system, server or workstation with Windows or Linux platform.

DCPM is able to monitor and manage devices in 2 ways: Either the devices are connected to the EnergySwitches or the devices can be accessed through a separately installed Racktivity agent.

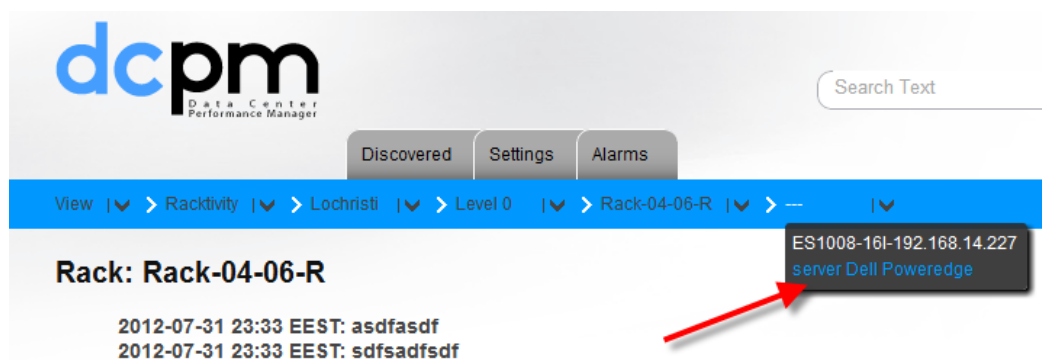
Different parameters like CPU usage, number of processes and the top applications can be monitored for each device.

To add a new device in DCPM:

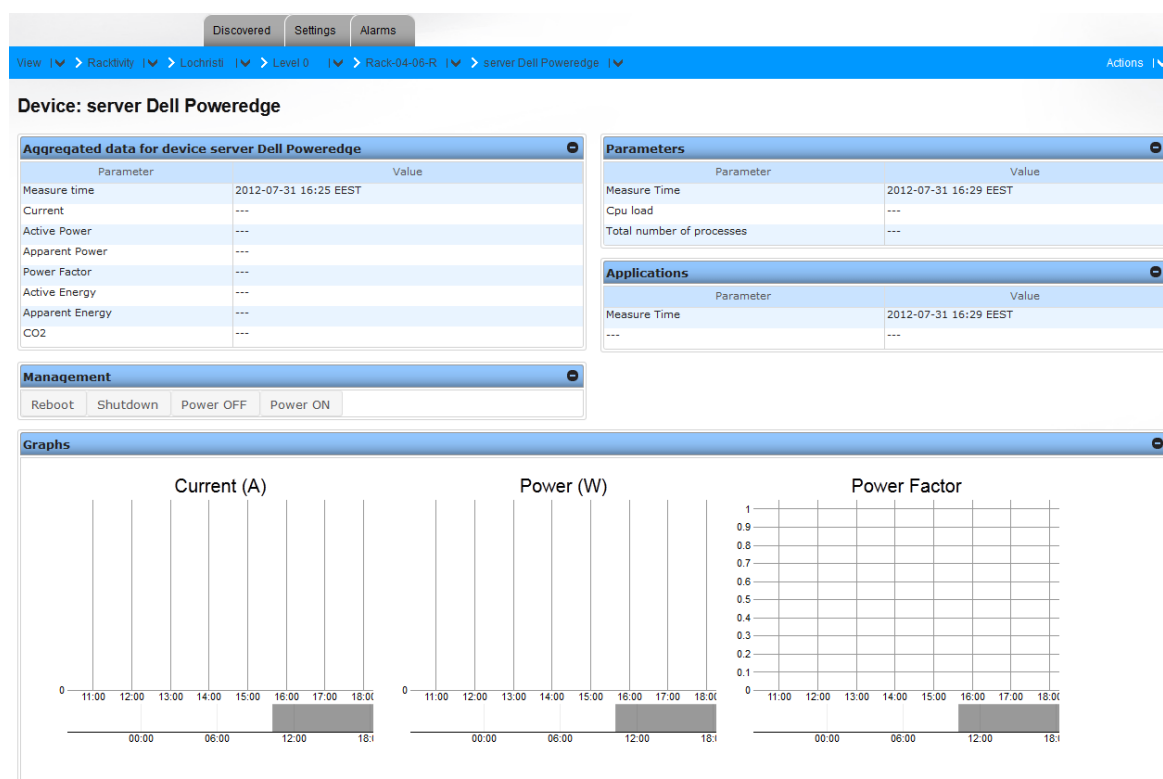
- Navigate to the rack space of your DC structure.
- Select the option **device** from the actions menu.



- Complete the wizard
 - Device parameters
 - Network info (device IP and port)
- After creation, the device becomes available on rack level via the navigation bar.



Detailed view:



Management options:

- Reboot - reboots the device by sending the reboot command to its operating system (via the agent)
- Shutdown - shuts down a device by sending the shutdown command to its operating system (via the agent).
- Power OFF - shuts down the power outlet(s) to which the device is connected
- Power ON - turns on the outlet(s) to which the device is connected

Note that for a user to be able to power off or power on the outlets connected to a device the "Perform actions on device" permissions have to be set on it. For more information on how to set user and group permissions go to ["User Management"](#) documentation section.

Created devices

In the settings page, section **devices**, DCPM provides the option to look for created but unconfigured devices. These are devices without network information and that cannot be accessed through DCPM.

| Discovered Settings Alarms | | | |
|--|------------|------------|---------|
| Admin > Settings > Created Devices | | | |
| Created devices are the devices that lack network information. To change this information go to the device page and edit the device. | | | |
| Created devices | | | |
| Device | Rack | IP Address | |
| Dell PowerEdge T110 II | Laboratory | | CREATED |
| HP ProLiant DL300 | Laboratory | | CREATED |
| IBM System x3250 M4 | Laboratory | | CREATED |

Select the device to access in edit mode and adapt the network data.

Outlet grouping

In case configured EnergySwitches are available, it is an option to link outlets from the connected EnergySwitches (only on rack level) via the device. There is a maximum of 8 outlets per device.

The linking can happen in 2 ways: via the creation process wizard or via the change device option in the actions menu.

Edit device
Network info

Name *
server Dell Poweredge

Type *
Dell

Tags
Enter tags in the form of tag1:value1;tag2:value2
type:device,parent:048e3283-132c-4856-8dbf-00af6a441556

Labels
Enter labels as comma separated values e.g. label1,label2

Description

☐ Disconnect from all outlets:

Outlet 1: ...

TEZT from ES1008-16i-192.168.14.227
Outlet 2 from ES1008-16i-192.168.14.227
Outlet 3 from ES1008-16i-192.168.14.227
Outlet 4 from ES1008-16i-192.168.14.227
Outlet 5 from ES1008-16i-192.168.14.227
Outlet 6 from ES1008-16i-192.168.14.227
Outlet 7 from ES1008-16i-192.168.14.227
Outlet 8 from ES1008-16i-192.168.14.227

Submit Cancel

As a result, following actions can be performed on group level:

- Visualize aggregated monitoring data
- Visualize aggregated graph data
- Power OFF: this function powers OFF **all connected ports**
- Power ON: this function powers ON **all connected ports**

HINT: if you want to measure aggregated data of multiple ports in a rack (example ports from a certain customer) you can set up a virtual device representing this customer and connect the required outlets.

Update Monitor Module (2/2)

Power feed *
 The feed providing the power for this monitor module

Submit Cancel

Racktivity agent

Installation

Agents are installed on physical and/or virtual machines.

They are used to monitor the machine itself and to allow us to cleanly shut down the machine if needed.

The monitored items are monitored at a 30 second interval and collapsed each 5 minutes. This collapsed data can then be retrieved from the agent or let the agent push it to DCPM.

With this info we can then later on provide very specific and accurate power usage up to application level.

To install the Racktivity agent the user should go to the following url:

<http://downloads.test.racktivity.com/agent/>

Select your agent type conform your operating system.

Debian based for 64 bit processor:

[racktivity-agent-1.0.0-amd64.deb](#)
648592

21-Mar-2012 12:22

Rehat (rpm based) for 64 bit processor:

[racktivity-agent-1.0.0-amd64.rpm](#)
647603

21-Mar-2012 12:22

Debian based for 32 bit processor:

[racktivity-agent-1.0.0-i386.deb](#)
630816

21-Mar-2012 12:22

Rehat (rpm based) for 32 bit processor:

[racktivity-agent-1.0.0-i386.rpm](#)
630190

21-Mar-2012 12:22

For Windows OS system use:

[racktivity-agent-1.0.0-win32.exe](#)
509897

21-Mar-2012 12:23

After installing the Agent on the server the user needs to configure the agent:

Configuration

The configuration can be done by changing the agent.ini file in a text file editor.

The agent.ini file can be found on:

- **Linux:** */etc/rackactivity/agent.ini*
- **Windows:** *c:\Program Files\Rackactivity\agent.ini* or *c:\Program Files (x86)\Rackactivity\agent.ini*

agent.ini

```
[main]
host=0.0.0.0
port=1666
workers=4
allowed=192.168.14.214,127.0.0.1,192.168.14.219
debug=0

[shutdown]
url=http://192.168.14.214/agent.cgi?ADDR=P1&INDEX=8&CMD=0

[reboot]
url=http://www.google.com/reboot

[monitor]
interval=30000
pushurls=http://localhost/somefunction
backlogsize=6
```

main

- **host:** The ip that the agent listens on.
0.0.0.0 means listen on any available ip address.
Default: 0.0.0.0
- **port:** The port that the agent listens on.
Default: 6666
- **workers:** The amount of worker threads that are used to handle the connections.
This does not mean we're limited to only 4 connections at once. This probably shouldn't be changed. **Default: 4**
- **allowed:** A comma separated list of ips that are allowed to communicate with the agent.
If the ip is not in the list the connection is closed instantly and the agent will not work.
Default: an empty list
- **debug:** If the agent adds debug information or not to the logs and/or console.
Default: 0

shutdown

- **url:** A url to the webpage that will be called when the shutdown command is sent.
If the value is empty then the machine where the agent is running is shut down.

If the value is "disabled" then nothing is done when calling the shutdown command.
Default: disabled

reboot

- **url:** A url to the webpage that will be called when the reboot command is sent.
If the value is empty then the machine where the agent is running is rebooted.
If the value is "disabled" then nothing is done when calling the reboot command.
Default: disabled

monitor

- **interval:** The interval (in milliseconds) at which we monitor the status of the machine.
Currently monitored: processes, CPU usage, disk space
Default: 30000
- **pushurls:** A comma separated list of urls that receive the data that is collapsed every 5 minutes.
The data is sent in JSON format to the urls by POST as the data parameter.
Default: an empty list
- **backlogsize:** The amount of "collapsed 5 minutes" monitored data points we keep in memory.
For instance if you set this to 6 then we keep a list of the last 6 "collapsed 5 minutes" monitored data points in memory.
Default: 6

Alarms

About Alarms

The alarm capabilities in DCPM enable the user to be notified of any imminent threat or required action to the monitored IT infrastructure.

Since alarms can be defined for all existing Components (except Enterprise) different attributes of these Components (like voltage, current, temperature etc.) can be monitored. This allows for a highly customized system that fits the required needs.

All Alarms are based on a specific set or source of information, the following sources are available:

- SNMP - Traps sent to DCPM from connected devices
- Monitoring - Data from devices is read and analyzed by DCPM every 5 minutes
- Trending - Aggregated monitoring data over longer periods of time
- Keep alive - When communication with devices or DCPM fails
- Formulas (as from version 1.4.0) – Alarms on formulas

An alarm is most commonly triggered when the value for an attribute is outside the predefined limits. The following actions can be executed when an alarm is triggered:

- Add to Alarm Panel
- SMTP notification (e-mail)
- SNMP trap notification
- Raise an internal event (for advanced users)

Creating Alarms

By default, all Component Pages (except Enterprise) will display the User Defined Alarms widget. This widget can be deleted by editing the Template for that Page.

The Alarm Wizard

1. Open the Component Page for which you would like to create an Alarm
2. Navigate to the User Defined Alarms widget
3. Press the Create Alarm button

| User defined alarms | | | | | | | | | |
|---------------------|----------|--------------------------------------|---------|------------|--------|--|------|--------|--|
| Type of alarm | Severity | Element | Check | Condition | Value | Actions | Edit | Delete | |
| Monitoring | Critical | This is PDU name-192.168.14.90 (Outl | Current | lower than | 5.00 A | Send an email 'Alarm' to lesley.zonnekei@racktivi Create alarm in Alarm Panel | Edit | Delete | |
| Create alarm | | | | | | | | | |

4. The first screen of the wizard enables you to select the information source, severity level and one or more actions to be executed.

Create Alarm definition for Energy Switch

Please choose source type of information:

- ☐ SNMP
- ☒ Monitoring
- ☐ Trending
- ☐ Periodic
- ☐ Formula

Severity level Critical

☐ Create this alarm for all Energy Switches

in Lesley`s Desk

☐ Use combined value of components

Action that should take place:

- ☒ Create alarm in Alarm Panel
- ☐ Save annotation of alarm
- ☐ Send SNMP trap
- ☐ Send an email
- ☐ Text message (SMS)
- ☐ Create internal event

for advanced users, you have to prepare code to handle that event.

Next Cancel

- a. **Severity Level:** Severity of the Alarm. The available Severity Levels are compliant with *ITU X.733 Systems Management: Alarm reporting function*.
- b. **Create this Alarm for all [Component]:** Enabling this option will duplicate the Alarm for all Components. For EnergySwitches the Scope selected on the Information Source screen will be the Scope for which the Alarm will be duplicated.

5. The individual wizard screens are explained in the following chapter.

Information Sources

SNMP

SNMP Alarms are SNMP traps sent by connected devices to DCPM that will trigger an Alarm. The SNMP Alarm data source is only available on single device Component Pages (discovered and configured EnergySwitch, Monitoring Module, other devices etc.) and not on aggregated Component Pages (Rack, Room, Datacenter, etc.).

Create snmp alarm for Energy Switch (2/3)

On: Device

When SNMP trap is received for Temperature (C)

and value is ☐ lower than ☐ higher than

Next Cancel

Scope

Use to set the scope of the selected Alarm. For a device this can be the whole device, a specific outlet or even an externally connected sensor.

Source

This is the parameter for which an SNMP trap is enabled. Besides common parameters (i.e.: current, temperature, etc.) the options Other and Catch All are also available.

- **Other:** Select this option if the list of sources does not contain the parameter for which you would like to create an Alarm. You will be asked to enter the OIDs for when the Alarm is raised, when it is cleared and what parameter it contains.
- **Catch All:** Select this option to catch all incoming SNMP traps.

Condition

This option describes the conditions that the Source must comply with for the Alarm to be triggered. The available options in the Condition are dependent on the selected Scope and Source. Condition is not available when **Other** or **Catch All** is selected as source.

Monitoring

Monitoring Alarms are based on the data DCPM retrieves from EnergySwitches, Monitoring Modules, devices, etc. every 5 minutes and are triggered by analyzing and/or comparing it against the previous set of monitoring data.

Create monitoring alarm for Energy Switch (2/3)

On: Device

Based on: ☒ Value ☐ Change

When Frequency (Hz) is ☐ lower than ☐ higher than ☐ equal to

Next Cancel

Scope

Use to set the scope of the selected Alarm. For a device this can be the whole device, a specific outlet or even an externally connected sensor.

Type

A monitoring Alarm can be based on an absolute value or the amount a value has changed.

- **Value:** The current value of the selected parameter will be compared to the value set in the Alarm. Absolute values are used.
- **Change:** The latest value retrieved will be compared to the previous value. This comparison is performed in percentage rather than an absolute value.

Condition

This option describes the conditions that the Source must comply with for the Alarm to be triggered. The available options in the Condition are dependent on the selected Scope and Type.

Trending

Trending Alarms are based on the analysis of sets of data over longer periods of time. The intervals between these data sets are expressed in hours (compared to 5 minute intervals with monitoring Alarms).

Create trending alarm for Energy Switch (2/3)

On: Device ▼

Based on: ☒ Value ☐ Change

When Average ▼ value for Frequency (Hz) ▼

is ☐ lower than ☐ higher than during last hour(s)

Next
Cancel

Scope

Use to set the scope of the selected Alarm. For a device this can be the whole device, a specific outlet or even an externally connected sensor.

Type

A monitoring Alarm can be based on an absolute value or the amount a value has changed.

- **Value:** The current value of the selected parameter will be compared to the value set in the Alarm. Absolute values are used.
- **Change:** The latest value retrieved will be compared to the previous value. This comparison is performed in percentage rather than an absolute value.

Condition

This option describes the conditions that the Source must comply with for the Alarm to be triggered. The available options in the Condition are dependent on the selected Scope and Type.

With the value Type selected the following options become available:

- **Average:** The average value of the selected parameter over the set amount of time.
- **Range:** The difference between the minimum and maximum value for the selected parameter over the set amount of time.

Periodic

A periodic alarm is used when the user wants DCPM to monitor over a period of time. User can go for the following period options.

- Hourly
- Daily
- Weekly
- Monthly

During the above selected period DCPM can generate an alarm on the minimum, the maximum or the average value for the selected object.

Create Periodic alarm definition for Energy Switch (2/3)

On: Device ▼

When hourly ▼ average ▼ of AC Current (A) ▼

value is ☒ lower than ☐ higher than

Next Cancel

Formula

Creating an alarm on formulas is only available as from DCPM version 1.4.0. Selecting the Formula will enable the user to set a threshold on a calculated formula. Alarm definitions for formulas can be generated on every layer of your structure.

Create Formula alarm definition for Datacenter (2/3)

On Datacenter

When value of PUE ▼ is ☒ lower than ☐ higher than ☐ equal to

Next Cancel

Actions

For each Alarm, one or more actions can be enabled on the first screen of the Alarm Wizard. Each selected action has its own option screen in the wizard and currently the available actions are:

- Create Alarm in Alarm Panel
- Send SNMP trap
- Send e-mail
- Create internal event (advanced users)

Alarm Panel

This Action will add this Alarm to the Alarm Panel when triggered. This screen has 2 fields, of which one is required and one is optional.

Create monitoring alarm for Energy Switch (3/3)

Create alarm in Alarm Panel

Message that represents what this alarm is about: *

You can use variables, e.g.: Monitoring alarm on %object%: %attribute% is %highlow% %boundary% (Actual value: %value%)

Monitoring alarm on %object%: %attribute% is %highlow% %boundary% (Actual value: %value%)

Additional information to show with alarm:

For links please use [test link](http://test.example.com).

Contact person responsible for A/C in DC_Q4.
Possible overheating issue|

Next

Cancel

Alarm Message (required)

The Alarm Message describes the Alarm. This message can contain several variables:

- **%guid%** - Object GUID
- **%object%** - Object name
- **%url%** - URL to object page
- **%path%** - Path to object (short version)
- **%attribute%** - Attribute to check
- **%highlow%** - Lower/higher/equal/different
- **%boundary%** - Threshold
- **%trendtype%** - If present, function for trend
- **%trendhours%** - If present, number of hrs for trend
- **%periodtype%** - For periodic alarms - type of period
- **%value%** - Value that raised alarm
- **%lastvalue%** - Previous value for monitoring alarms on change
- **%trendvalue%** - Trend value (average/range) for trending alarm
- **%msg%** - Original message taken from SNMP trap, if found

Additional information

Enter additional information here. This can be explanatory text, instructions for the operator etc.

SNMP Trap

With the SNMP Trap Action selected you will be presented with the following screen during the Alarm creation process:

Create monitoring alarm for Energy Switch (3/3)

Send SNMP trap

First SNMP Host *

192.168.14.123

Second SNMP Host

127.14.12.19

Third SNMP Host

SNMP Port *

162

SNMP Port

553

SNMP Port

162

Community String *

public

Community String

internal_comm

Community String

Next

Cancel

- **SNMP Host:** The IP of the trap receiver.
- **SNMP Port:** The network port (0 - 65535) of the trap receiver.
- **Community String:** Client authentication string.

When required, the SNMP Trap Action can be sent to up to 3 SNMP trap receivers by entering a second and/or third SNMP Host.

E-mail

The E-mail Action will require you to enter one or more recipient e-mail addresses. Multiple addresses can be separated by using a comma (",") between each address.

Create monitoring alarm for Energy Switch (3/3)

Send an email
Email recipient: *

support@rackactivity.com,info@rackactivity.com

Next Cancel

Internal Event

This option is for system integrators or when expanding the DCPM system only and requires additional code to be written manually. Contact Rackactivity Support for more details.

Create monitoring alarm for Energy Switch (3/3)

Create internal event
Routing Key: *

Next Cancel

Modifying Alarms

Edit

To edit the properties of an existing Alarm:

1. Navigate to the Component Page of the Alarm.
2. Scroll to the User Defined Alarms section.
3. Click the Edit button next to the desired Alarm.
4. The Alarm Wizard will be opened. Follow the screens as described above.

Note: When editing an Alarm that was duplicated for all Components of the same type (see chapter:) use the "Alarm was created for all [Components]. Apply changes to all." checkbox to edit all Alarms simultaneously.

Delete

To delete an existing Alarm:

1. Navigate to the Component Page of the Alarm.

2. Scroll to the User Defined Alarms section.
3. Click the Delete button next to the desired Alarm.

Note: When deleting an Alarm that was duplicated for all Components of the same type you will be prompted to delete only this Alarm or all Alarms for the same Component.

Reporting

As from DCPM version 1.3.5 the user is able to create his own reports. Reports can be generated through the action menu on the right side of the menu bar.

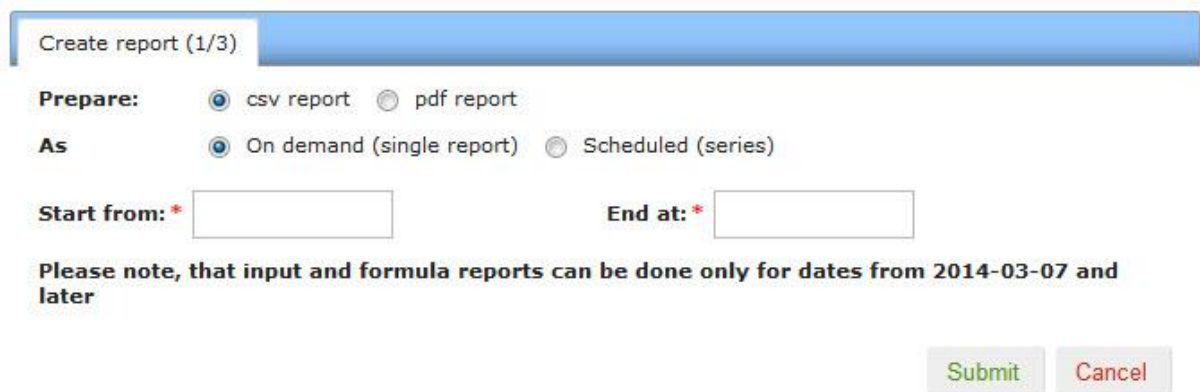
When a report is created the user will be able to receive the requested report by e-mail. This would only be the case when all SMTP parameters are set up correctly.

On demand reporting or scheduled reporting

As from Version 1.4.0 the user is able to generate on demand reports or schedule his reports to receive them on the selected time frames. Prior to starting selecting objects the user will be asked if he likes to generate on demand or scheduled reporting.

On demand

When only one report needs to be made the user can choose the option on demand reporting and select his start and end date for report creation. In this section the user needs to select the option to receive his report in csv or pdf format.



Scheduled Reporting

Scheduled reporting is available as from version 1.4.0. When a user creates a report via the action button he can prepare his csv or pdf report as a scheduled series.

The user has the option to receive reports on a daily, weekly and monthly time interval. The report can be generated over a preselected period of time (from one day to 12 months).

Create report (1/3)

Prepare: ☐ csv report ☒ pdf report

As ☐ On demand (single report) ☒ Scheduled (series)

Every week (Monday) create report for 7 days

Please note, that input and formula reports can be done only for 49 days

[Submit](#) [Cancel](#)

Formulas on reporting can only be done for the period of the selected daily retention scheme in the settings menu.

Reporting on enterprise level

To create a report on enterprise level the user needs to go to the action menu on enterprise level and press “create report under the action menu.



A new window will pop up asking the user to select (this is the case for versions < 1.4.0):

- the desired structure level to retrieve the data from
- Metrics
- Time interval
- Report in csv or pdf

In this window the user can select multiple items to get the report.

Create report (1/2)

Report data from: *

- ☒ Child Locations
- ☒ Child Datacenters
- ☐ Child Floors
- ☐ Child Rooms
- ☐ Child Rows
- ☐ Child Racks
- ☐ Child Energy Switches
- ☐ Child Outlets
- ☐ Child Feed Monitor/Energy Consumers
- ☐ Child Lines
- ☐ Child Environmental Sensors
- ☐ Child Devices
- ☐ Root Feeds
- ☐ Sub Feeds

Metrics: *

- ☒ AC Current (A)
- ☐ AC Power (W)
- ☐ Apparent Energy (kVAh)
- ☐ CO2 (g)
- ☐ DC Current (A)
- ☐ DC Power (W)
- ☐ Frequency (Hz)
- ☐ Power Factor
- ☒ AC Energy (kWh)
- ☐ AC Voltage (V)
- ☐ Apparent Power (VA)
- ☐ Charging Energy (kWh)
- ☐ DC Energy (kWh)
- ☐ DC Voltage (V)
- ☐ Humidity (%)
- ☐ Temperature (C)

Start from: *
End at: *

Report as: ☒ csv ☐ pdf

Submit Cancel

When the desired items are selected the user can select the “submit” button. DCPM allows the user to select multiple items in these boxes

A new window will pop up asking how to present the report and asking for a valid email address to send the report to.

Create report (2/2)

Report generation may take a few minutes. You will receive an email when it is available.

File organization: ☒ One file ☐ Multiple files

Layout:

☒

| Component | Metric 1 | Metric 2 | Metric 3 |
|-----------|----------|----------|----------|
| Date 1 | | | |
| Date 2 | | | |
| Date 3 | | | |
| Date 4 | | | |

☐

| Metric | Date 1 | Date 2 | Date 3 |
|---------------|--------|--------|--------|
| Component 1 | | | |
| Component 2 | | | |
| Component 2.1 | | | |
| Component 3 | | | |

E-mail: *

Submit Cancel

When entering a valid email address DCPM will sent the desired report to this email address. Sending the report to the user can take a few minutes depending on the report size.

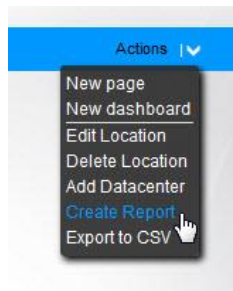
Reporting on location level

Reporting on a location level can be done by drilling down up to the location level. When pressing the action button the user will have two options for creating a report.

- Create Report
- Export to csv.

Creating a report will generate minimum, maximum and average data for the selected time frame per day

“Export to CSV” will generate a csv file with the output RAW data collected by DCPM on a five minute interval basis.

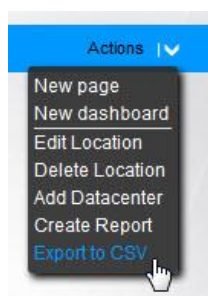


Pressing “create report” provides the user again the possibility to select the following:

- Data from Location or its children
- Metrics
- Time interval
- Report as .csv or .pdf file

Pressing the submit button a new window will pop up asking how to present the report and asking for a valid email address to send the report to.

When entering a valid email address DCPM will sent the desired report to this email address. Sending the report to the user can take a few minutes depending on the report size.



Pressing “Export to CSV” will provide the user whit RAW output data collected by DCPM in CSV format. All output data will be aggregated and presented in this report.

The user will be asked on how to present the RAW data for the selected location. The user can select to use a different field separator.

- ; (semicolon)
- , (comma)
- : (colon)

When the desired field separator is selected the user must indicate the desires time stamp and must provide a valid email address to send the report to.

Following RAW data will be presented in csv format on a five minute interval basis for the selected period:

- AC Energy (kWh)
- Apparent Energy (kVAh)
- Apparent Power (VA)
- Charging Energy (kWh)
- CO2 (g)
- AC current (A)
- DC current (A)
- DC Power (W)
- DC Energy (kWh)
- DC Voltage (V)
- Frequency (Hz)
- Humidity (%)
- AC Power (W)
- Power factor
- Temperature (C)
- AC Voltage (V)

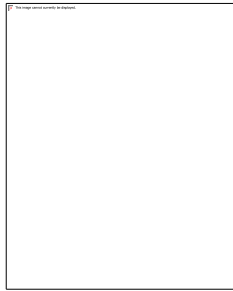
Reporting on datacenter Level

Reporting on a datacenter level can be done by drilling down up to the datacenter level. When pressing the action button the user will have two options for creating a report.

- Create Report
- Export to csv.

Creating a report will generate minimum, maximum and average data for the selected time frame per day.

Doing an export to csv will generate a csv file with the output RAW data collected by DCPM on a five minute interval basis.



Pressing “create report” provides the user the possibility to select the following:

- Data from Location or its children
- Metrics
- Time interval
- Report as .csv or .pdf file

Pressing the submit button a new window will pop up asking how to present the report and asking for a valid email address to send the report to.

When entering a valid email address DCPM will send the desired report to this email address. Sending the report to the user can take a few minutes depending on the report size.



Pressing “Export to CSV” will provide the user with RAW output data collected by DCPM in CSV format. All output data will be aggregated and presented in this report.

The user will be asked on how to present the RAW data for the selected location. The user can select to use a different field separator.

- ; (semicolon)
- , (comma)
- : (colon)

When the desired field separator is selected the user must indicate the desired time stamp and must provide a valid email address to send the report to.



Following RAW data will be presented in csv format on a five minute interval basis for the selected period:

- AC Energy (kWh)
- Apparent Energy (kVAh)
- Apparent Power (VA)
- Charging Energy (kWh)
- CO2 (g)
- AC current (A)
- DC current (A)
- DC Power (W)
- DC Energy (kWh)
- DC Voltage (V)

- Frequency (Hz)
- Humidity (%)
- AC Power (W)
- Power factor
- Temperature (C)
- AC Voltage (V)

Reporting on formulas

Reporting on Formulas can be done in every layer of the structure.

The formula name will be presented by DCPM when the user wants to create a report.

When pressing the action button the user will have two options for creating a report.

- Create Report
- Export to csv.

Creating a report will generate minimum, maximum and average data for the selected time frame per day.

Alarm Space

The **alarms** space has 3 subpages:

- Operator panel: this is an overview of all alarms and warnings and the related actions. There are 5 levels of severity for alarms (compliance with ITU X.733).
- Map: mapped overview of alarms. In case one has been created.
- It is overview of all acknowledged and automatically switched off. Alarms history is kept according to "retention" settings

The Alarm Space can be accessed by selecting the Alarms View or clicking the Bookmarks Alarm tab (if configured) to view all active Alarms in DCPM.

The active Alarms are displayed on the left side of the interface and are grouped by severity (as configured in the Alarm Wizard) as tabs.

Click any of the severity tabs to see all active Alarms for that level.

| Critical (0) | | Major (2) | | Warning (0) | | Minor (0) | | Indeterminate (0) | |
|-----------------------|--|-----------|--|---|--|-----------|--|-------------------|--|
| Date | | Location | | Message | | | | | |
| 2012-08-27 16:25 CEST | | RCK02_4 | | Monitoring alarm on ES1008-16I-192.168.14.125: AC Voltage | | | | | |
| 2012-08-27 16:25 CEST | | RCK02_4 | | Monitoring alarm on ES1008-16I-192.168.14.125: Frequency | | | | | |

Select one of the active Alarms to see the details on the right side of the screen.
The detailed information contains the following information:

- **Severity** of the Alarm with the **Alarm Message** as configured in the Alarm Wizard.
- **Location**: the location where the Alarm was triggered. This can be any Component (except Enterprise).
- **System Time**: The time at which the Alarm occurred.
- **Action Hints**: The additional information configured in the Alarm Wizard.
- **Detailed log**: Request Rackivity detailed log. Detailed log is downloaded from hardware and translated into comma-separated values file. As this process may take few minutes, you will be informed with an email when file is available.

Detailed information

Critical: Monitoring alarm on ES2024-16-192.168.14.164 ((Toggle this outlet DEMO)): AC Current is higher than 0.10 A (Actual value: 0.34 A)

Location: ES2024-16-192.168.14.164 / [ES2024-16-192.168.14.164 \(\(Toggle this outlet DEMO\)\)](#)

System Time: 2014-01-21 12:24 CET

Action hints:

Detailed log: [Request Rackivity detailed log](#)

Acknowledge

[Alarm Map](#) | [Alarm History](#)

Acknowledging Alarms

To Acknowledge an Alarm select the desired active Alarm in the Alarm Panel and click the Acknowledge button.

You will be asked to fill out a required note regarding the handling and/or processing of the Alarm. Once completed the Alarm will be removed from the active Alarms list in the Alarm Panel and moved to the Alarm History.

Acknowledge alarm

Note *
Please note what was done regarding this alarm

Checked with maintenance (Q4.1)

Submit Cancel

Alarm History

The Alarm History can be accessed through the link at the bottom of the detailed information section of the Alarm Panel and contains all acknowledged Alarms.

The Acknowledged alarms do have the following information

- Date created: Date when the alarm did occur
- Date acknowledged: Date when the alarm is acknowledged
- Message: This indicated what the alarm was about.
- Component: What did cause the alarm
- Parent: What is the direct parent structure wise of the component
- Acknowledge note: this indicates the user note and name of the alarm when acknowledged.

| Acknowledged alarms | | | | | |
|---------------------|-------------------|----------------------------------|---|----------------------|------------------|
| Date created | Date acknowledged | Message | Object | Parent | Acknowledge note |
| 2012/03/29 14:03 | 2012/03/29 14:22 | ES1008-161-10.130.254.100: Power | ES1008-161-10.130.254.100 | rack | ack note |

Alarm Map

Like the Alarm History, the Alarm Map can be found at the bottom of the detailed information section of the Alarm Panel. The Alarm Map shows all active Alarms

Reports space

Via this space you can access the report page with all standard reports. By clicking the button **more** the report output can be customized by setting dates.

DCPM reports space contains some standard pre-defined reporting to the user. Pre-defined reports are:

- Co2 Report for each of the datacenters created in your structure
- Feeds report for each of the created datacenters
- Energy per customer report
- Energy per device report
- Power per customer report

Co2 report for datacenter

This is a small report which shows the user the carbon footprint of every datacenter created. This report will only contain data if the feeds of the datacenters are defined. If no feeds are created the report will contain no data.

Feeds report for datacenter

This is a pre-defined report containing the capacity and usage of every defined feed in the datacenter. Pressing the more button on the page will direct the user to a more detailed report. On this detailed report the user can view capacity on all main and subfeeds. This detailed report is presenting input or output data.

Input data: Data collected by feed monitor

Output data: Data collected by the energy consumers or energy switches.

| Feeds detailed report for datacenter Datacenter BRU1 | | | | | | |
|---|------------------|----------------|--------|------------------|---------------|---------------|
| Feed names: All Feed levels: All Data source: <input checked="" type="radio"/> Output <input type="radio"/> Input | | | | | | |
| Date period: custom From To | | | | | | |
| Feeds | AC Current | DC Current | Usage | Maximum Capacity | Minimal Usage | Maximal Usage |
| L3_main | 11.79 A (9.43%) | 0.00 A (0.00%) | 9.43% | 125.00A | 11.71A | 11.80A |
| L3_IT | 11.79 A (11.79%) | 0.00 A (0.00%) | 11.79% | 100.00A | 11.71A | 11.80A |
| L2_Main | 5.31 A (4.25%) | 0.00 A (0.00%) | 4.25% | 125.00A | 5.21A | 5.31A |
| L2_IT | 5.31 A (5.31%) | 0.00 A (0.00%) | 5.31% | 100.00A | 5.21A | 5.31A |
| L1_main | 17.74 A (14.19%) | 0.00 A (0.00%) | 14.19% | 125.00A | 13.08A | 17.78A |
| L1_IT | 17.74 A (17.74%) | 0.00 A (0.00%) | 17.74% | 100.00A | 13.08A | 17.78A |

Page template: reports/reportfeedsdetails.html, generated: 2013-05-21 12:30 CEST

The user can present the one or more feeds by selecting the drop down menu Feed names. The user can present the feed levels/ sublevels by pressing the Feed levels drop down menu. Period for data is presentable and can be customized by the user by selecting a start and end date.

Energy per customer report

In the energy per customer report the user can present an overview on the amount of energy used by each customer. The report is using the tag **customer:x**

Based on the feed information and cost the report will present the amount of energy and the related cost for the defined customer. When pressing the more button the user will be able to set his desired date for reporting.

In the detailed report the user has also the option to select the report per datacenter.

| Energy per customer detailed report | | | | |
|--|-------------|-----------|----------------|----------------|
| Select datacenter: Datacenter NY1 | | | | |
| Date period: custom From 1-1-2014 To 22-1-2014 | | | | |
| Customers | AC Energy | DC Energy | Cost AC Energy | Cost DC Energy |
| Awingu | 917.87 kWh | 0.00 kWh | 211.11 Euro | 0.00 Euro |
| Incubaid | 280.15 kWh | 0.00 kWh | 42.02 Euro | 0.00 Euro |
| Rackivity | 119.01 kWh | 0.00 kWh | 17.85 Euro | 0.00 Euro |
| Average | 439.01 kWh | 0.00 kWh | 90.33 Euro | 0.00 Euro |
| Devices not assigned to customers | 6801.82 kWh | 0.00 kWh | 828.82 Euro | 0.00 Euro |

Energy per device report

This reports presents the total energy of every defined device in DCPM. DCPM will calculate the cost if the device is connected to a pre-defined feed.

Power per customer report

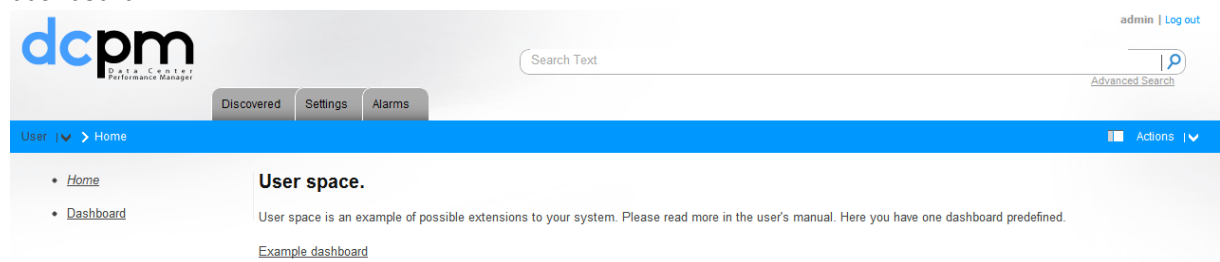
In the power per customer report the user can present an overview on the amount of energy used by each customer. The report is using the tag **customer:x** to present values. Pressing the more button the user is able to set his start and end date


User space

The user space shows the available dashboards and gives option to add and edit dashboards or pages. Pages are created with htm5 code used in DCPM, dashboards can be created by using available widgets from DCPM.

Create / Edit page

The user space contains 1 page with a separate navigation bar at the left and 1 example dashboard.



With icon  you can choose to visualize the detailed page tree. (index)
By default the page sections are visible.

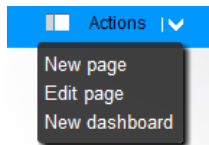
Add page in user space

A page can be created in every space in DCPM however the pages and dashboards are only indexed in the user space.

Other pages can be found via the search functions.

Pages can be filled with any kind of information (maps, information, reports....)

Edit main page screen



Select the option **edit page** from the actions menu to edit the page and put information that is relevant for the user

Name: Home
 Title: Home
 Description:
 Parent: No Parent
 Type: Markup
 Tags: page:Home space:User Home
 Order: 10000

```

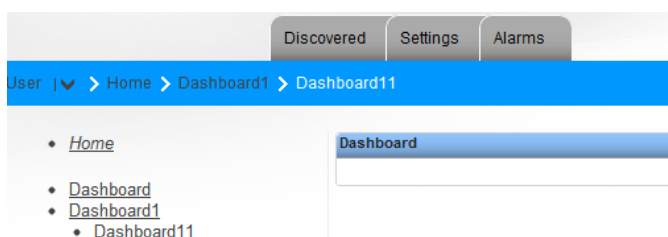
1 |
2 | ### User space.
3 |
4 | User space is an example of possible extensions to your system. Please read more in the user's manual.
5 | Here you have one dashboard predefined.
6 |
7 | [Example dashboard] (#/User/Dashboard)
  
```

By editing the page the user can customize a full page by entering data in markup format. If a page is created the user can use html5 code to add some graphs or other available data. Free text can be added by using Markup.

Add dashboard

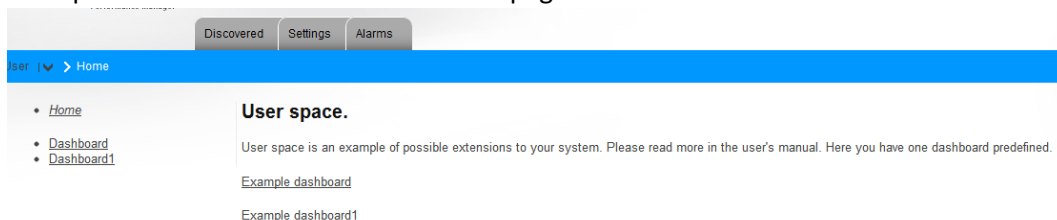
- Select **new dashboard** from the actions menu
- Add Name and Title
- Parent: parental page for the dashboard
- Visibility: per user or global
- Order: ordering the page tree (1-2-3...)

A created dashboard becomes available in the page tree.



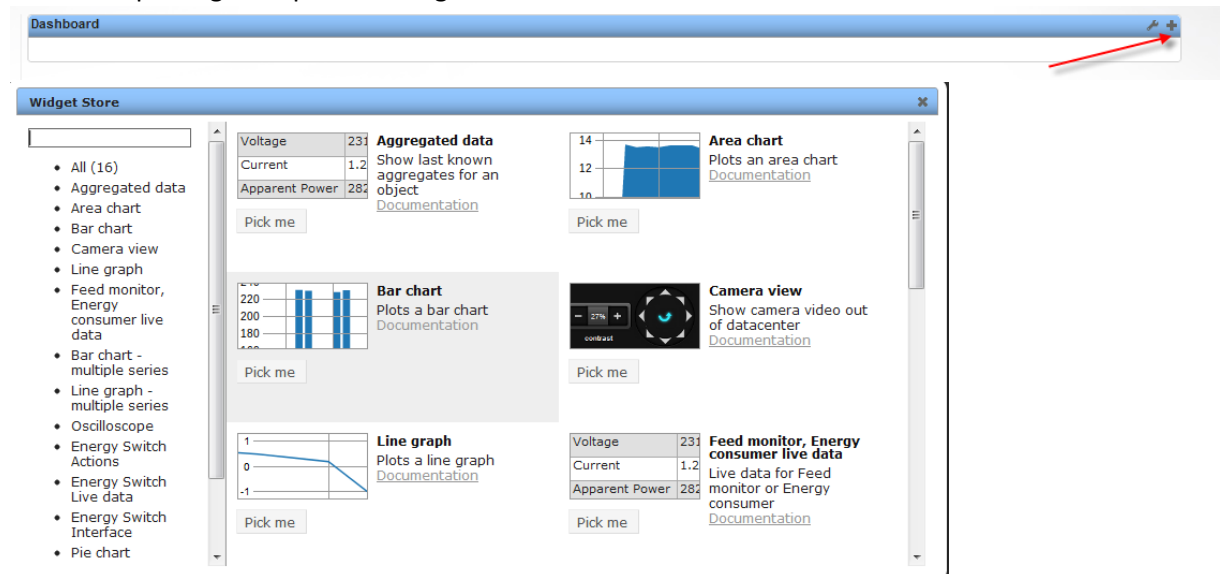
It is also possible to add the new dashboard to an existing page or new page.

Example: dashboard1 added to main user page



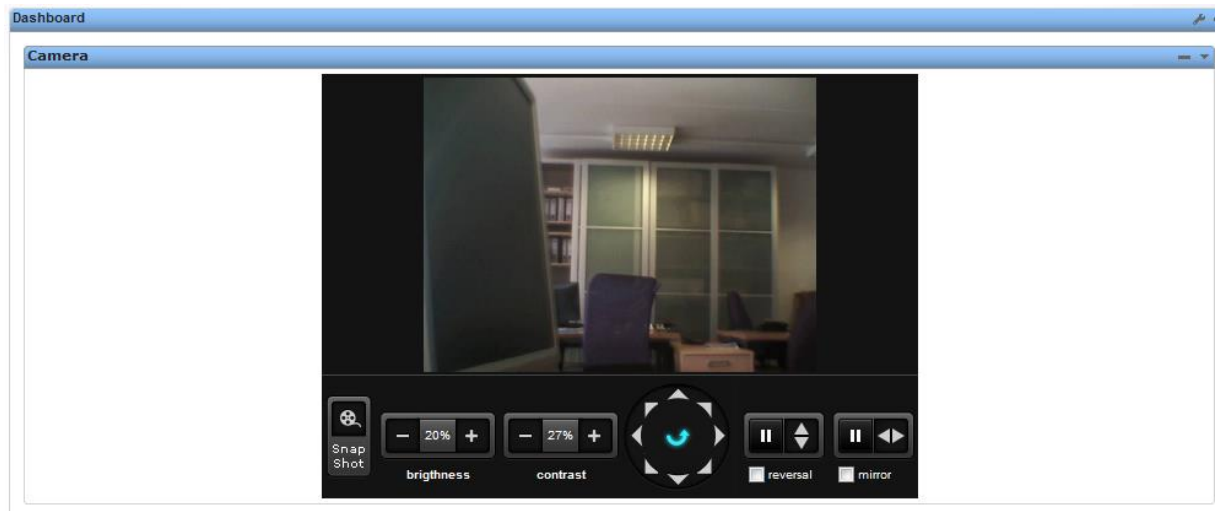
Add widget to a dashboard

Dashboards can be extended with predefined widgets.
Select the plus sign to open the widget store:



Example: camera widget

The screenshot shows the configuration form for a 'Camera widget'. The form has a blue header bar labeled 'Camera widget'. Below the header, there are several input fields and a dropdown menu. The fields are: 'Title' (with a red asterisk), 'Camera IP/Host' (with a red asterisk and a note: 'IP (or host name) of compatible camera. Port if needed, should be added after colon.'), 'Username' (with a red asterisk and a note: 'User name to access the camera'), and 'Password' (with a red asterisk and a note: 'Password to access the camera'). Below these fields is a dropdown menu for 'Camera brand/type' (with a red asterisk and a note: 'Brand and type of the camera.'). The dropdown menu is open, showing a list of camera brands: Apexis PTZ, Apexis, Axis 207, DLink CS-2121, Wanscam, and Wanscam PTZ. At the bottom right of the form, there are 'Submit' and 'Cancel' buttons.



Doc space

In the documentation space the user is able to get the manual of DCPM and consult this.

IDE Space

The IDE space is the Integrated Development Environment of DCPM. In this section the user can edit his projects or can even change the look and feel of DCPM by adding or removing data from pre-defined templates.

The user needs to know html5 code in order to perform changes in DCPM.

DCPM Macros

DCPM is highly customizable; this is due to the fact that you can develop your own macros.

There are two types of macros:

- **PyLabs Macros**
- **JavaScript Macros**

PyLabs Macros

PyLabs Macros render content based on the PyLabs tags defined in the body of the macro and the content of the page. The content that this macro renders is a result of the execution of certain tasklets.

JavaScript Macros

JavaScript Macros, on the other hand, have to do with editing the page. These macros can have a wide range of usage, from highlighting code and showing a Google map, to adding a Wizard. The macro files themselves (JavaScript files) are stored in `/opt/qbase5/www/lfw/js/macros` and must have unique names.

In this section you can find an overview of the available macros and how you can [create your own macro](#).

Using Macros in Documentation

When you [create a page](#), you can add macros to for example to add a graphic or information block.

To include a macro on a page, you have to apply this structure:

```
[[name_of_macro]][[/name_of_macro]]
```

Each macro has its own properties: some macros need data, some need configuration, and some macros work without any additional information.

Macro Configuration

Configuration parameters of a macro are added in the opening tag of the macro:

```
[[name_of_macro: param1=foo, param2=480]][[/name_of_macro]]
```

Macro Data

If a macro needs data, for example to build a graph, then this must be provided in the body of the macro, for example see the [RGraph Macro](#).

If the macro doesn't have a body, then you can use the short notation of the macro, similar to the short notation of an html tag:

```
[[name_of_macro/]]  
or
```

```
[[name_of_macro: param1=foo, param2=480 /]]
```

REST Calls

A parameter of a macro can also be a [REST call](#) to a PyApps' application server service. This allows you to execute a service inside your macro.

To make a REST call in a macro use the following structure:

```
[[name_of_macro:  
call=appserver/rest/link/to/appserver/service]][[/name_of_macro]]  
for example:
```

```
[[note: call=appserver/rest/ui/portal/listSpaces]][[/note]]  
results in:
```

```
[ "View", "Admin", "Alarms", "Reports", "User", "Doc", "IDE" ]
```

Overview of Existing Macros

List of Predefined Macros

- Actions Macro
- Aggregated Data Macro
- Area Chart Macro
- Bar Chart Macro
- Button Macro
- CO2 Footprint Detailed Report Macro
- CO2 Footprint Report Macro
- CPU vs. Power Macro
- Camera Macro
- Children Macro
- Dashboard Macro
- Device Management Macro
- Energy Cost per Application Report Macro
- Energy Switch Actions Macro
- Energy per Application Report Macro
- Energy per Customer Detailed Report Macro
- Energy per Customer Report Macro
- Energy per Device Detailed Report Macro
- Energy per Device Report Macro
- Feeds Detailed Report Macro
- Feeds Report Macro
- Generic Macro
- Grid Macro
- Heat Map Detailed Report Macro
- Include Macro
- JqPlot Macro
- Line Graph Macro
- Map Editor Macro
- Map Macro

- Monitormodule Live Data Macro
- Multi Bar Chart Macro
- Multi Line Graph Macro
- Notification Macro
- Oscilloscope Macro
- Page Tree Macro
- Page Validator Macro
- Pdu Live Data Macro
- Pie Chart Macro
- Port Data Macro
- Power per Customer Detailed Report Macro
- Power per Customer Report Macro
- Protovis Macro
- RGraph Macro
- Rackactivity Tree Macro
- Redirect Macro
- Schematics Macro
- Script Macro
- Sensor Data Macro
- Stacked Area Chart Macro
- Style Macro
- Table Macro
- Widget Macro
- Wizard Macro
- Input / output or both presentation macro

Actions Macro

The Actions macro allows users to create a button that performs a certain action. The button information is located in a tasklet that gets executed by the generic service.

Parameters

None.

Action Tasklets

The tasklets are located under:

/opt/qbase5/pyapps/dcpm/impl/portal/pylabsmacro/actions/

Currently we have a sample tasklet called "test1.py" which contains the information of two buttons. Below is the tasklet code:

```
__author__ = "incubaid"

def main(q, i, params, tags):

    l={"action": [
        {"name": "Print", "description": "Print this page", "uri":
"javascript:print();", "target": "", "icon": "ui-icon-print"},
        {"name": "Google", "description": "Go To Google", "uri":
"http://www.google.com", "target": "_blank", "icon": "ui-icon-link"}
```

```

    ]}

    params['result'] = 1

def match(q, i, params, tags):
    return True

```

When defining a button in a tasklet, as shown in the code above, it should contain the following parameters:

- **name:** is the name that will appear on the button.
- **description:** is the help text that will be displayed when you hover on the button.
- **uri:** the action call; for example: "http://www.google.com" or "javascript:print();".
- **target:** specifies where to open the linked document.
- **icon:** is the icon that will be given to the button.

Example

To call the Action macro, we use:

```
[[actions]][[/actions]]
```

Sample



Aggregated Data Macro

The Aggregated Data Macro allows you to view aggregated data for a particular object (location, datacenter, pdu etc.)

Parameters

This macro accepts the following parameters:

- **type:** the type of the object (location, datacenter, pdu etc.)
- **guid:** object global unique identifier

Example

```
[[aggregateddata:guid=1609008f-1006-49f4-b599-e3eeecfdebd2,
type=datacenter]][[/aggregateddata]]
```

Sample

| Title | | |
|------------------|-----------|---------------------|
| | Parameter | Value |
| Aggregation time | | 2011-11-21 15:35:00 |
| Voltage | | 226.63 V |
| Current | | 5.039 A |
| Apparent Power | | 1141 VA |
| Power Factor | | 0.88 |
| Active Power | | 1001 W |
| Active Energy | | 1227.926 kWh |
| Apparent Energy | | 1388.526 VAh |
| Frequency | | 50.002 Hz |
| Temperature | | 28.4 °C |
| Humidity | | --- |

Area Chart Macro

The Area Chart Macro allows you to view certain data for a particular object (location, datacenter, pdu etc.) For instance a graph with one of the following types of data can be shown:

- Voltage
- Power
- Active energy
- Frequency etc.

Parameters

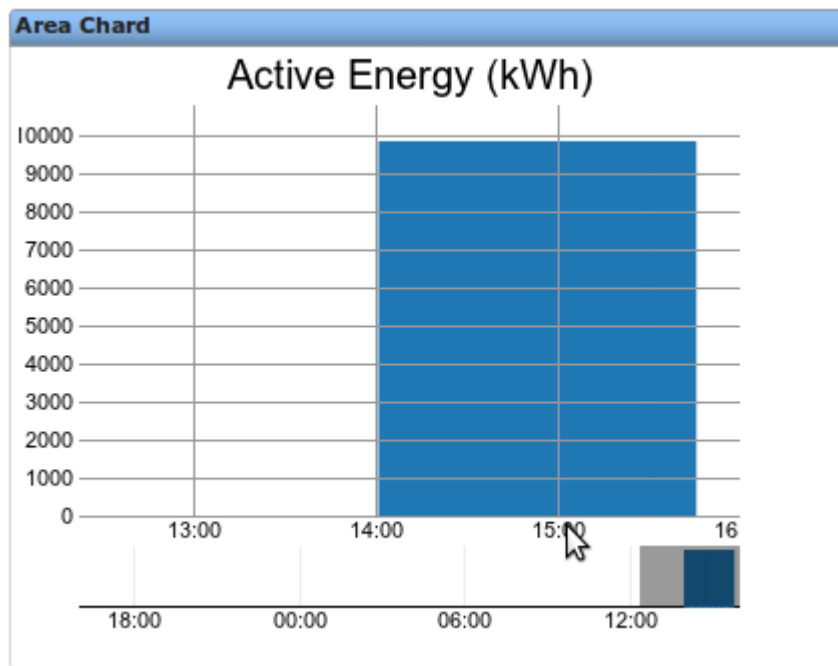
This macro accepts the following parameters:

- type: the type of data to be shown (power, active energy, voltage etc.)
- guid: object global unique identifier
- timespan: show data for a particular time interval. For instance use 'e-1d' to show only data for last day. Other possible values are: 'e-1w' (last week) or 'e-1m' (last month).
- refresh: number of seconds after which the graph should be refreshed.
- label: the label to be used for the graph.
- resolution: number of seconds for each data sample represented on the graph.

Example

```
[[areachart:timespan=e-1d, guid=1609008f-1006-49f4-b599-e3eeecfdebd2,
type=activeenergy, refresh=30, label=Active Energy,
resolution=900]][[/areachart]]
```

Sample



Bar Chart Macro

The Bar Chart Macro allows you to view certain data for a particular object (location, datacenter, pdu etc.) For instance a bar chart with one of the following types of data can be shown:

- Voltage
- Power
- Active energy
- Frequency etc.

Parameters

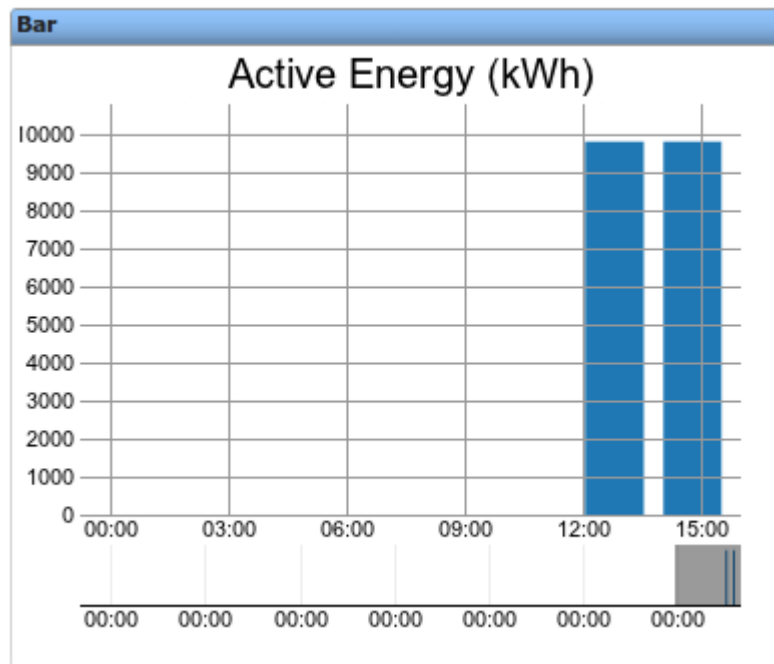
This macro accepts the following parameters:

- type: the type of data to be shown (power, active energy, voltage etc.)
- guid: object global unique identifier
- timespan: show data for a particular time interval. For instance use 'e-1d' to show only data for last day. Other possible values are: 'e-1w' (last week) or 'e-1m' (last month).
- refresh: number of seconds after which the graph should be refreshed.
- label: the label to be used for the graph.
- resolution: number of seconds for each data sample represented on the graph.

Example

```
[[barchart:timespan=e-1d, guid=1609008f-1006-49f4-b599-e3eeecfdebd2,
type=activeenergy, refresh=30, label=Active Energy,
resolution=900]] [[/barchart]]
```

Sample



Button Macro

The Button macro allows you to add a button to your page which executes some javascript code.

Parameters

The macro accepts the following parameters:

- href: link to a page
- click: javascript code that is executed when clicking the button
- name: name that appears on the button
- title: title of the button, appears when you hover over the button
- target: [target](#) of the link
- icon: change the default icon of the button

Example

```
[[button:href=#/Doc/MacroButton, click=alert("This is DCPM"), name=Button, title=Title, target=_blank /]]
```

Sample



How to Modify the Button Icon

Instead of using the default button icon as in the example above, one can choose his own icon. In this example we use a smiley icon (emoticon_smile.png, taken from www.famfamfam.com), that replaces the caret (^) sign. To do so, you have to add an icon to your system. The location of the icon in PyLabs is `/opt/qbase5/www/lfw/img`. This directory already contains a set of graphics. For maintenance reasons it is recommended to create a directory, for example `icons` in which you store the icons.

To make the icon available, you have to add a class to `theme.css` of your application. This file is located in `/opt/qbase5/www/lfw/css`. To add class add the following line, provided that the icon, `emoticon_smile.png` is stored in `/opt/qbase5/www/lfw/img/icons`:

```
.ui-state-default .<classname> {background-image: url("<link to icon>")}
```

where:

- : class name that you can use for the icon parameter of your button
- : link to the name of the icon, relative from `/opt/qbase5/www/lfw/css`

For example:

```
.ui-state-default .emoticon-smile {background-image:
url("../img/icons/emoticon_smile.png")}
```

For each icon that you want to use in your application, you have to create a new class.

Define a button with a custom icon as follows:

```
[[button:href=#/alkiradocs/MacroButton, click=alert("This is Incubaid"),
name=Button, title=Title, target=_self, icon=<class name>]]
```

for example:

```
[[button:href=#/alkiradocs/MacroButton, click=alert("This is Incubaid"),
name=Button, title=Title, target=_self, icon=emoticon-smile/]]
```

CO2 Footprint Detailed Report Macro

This macro displays a detailed report of CO2 emissions for a particular datacenter on all levels, from energy switch to datacenter level.

Parameters

- `datacenter`: the datacenter global unique identifier for which the report should be generated.

Example

```
[[reportCO2details: datacenter=266d9653-9c8a-4496-ad3e-
2f193e4a5794]] [[/reportCO2details]]
```

Sample

| Last day ▼ | | |
|---------------|--------------|-----------------|
| Feeds | CO2 produced | Energy consumed |
| Feed #1 | 77.22 g | 3.51 kWh |
| Feed #1_1 | 77.22 g | 3.51 kWh |
| Feed #1_1_1 | 77.22 g | 3.51 kWh |
| Feed #1_1_1_1 | 51.48 g | 2.34 kWh |
| Feed #1_1_1_2 | 25.74 g | 1.17 kWh |
| Feed #1_1_2 | 0.00 g | 0.00 kWh |
| Feed #1_1_2_1 | 0.00 g | 0.00 kWh |
| Feed #1_1_2_2 | 0.00 g | 0.00 kWh |
| Feed #2 | 0.00 g | 0.00 kWh |
| Feed #2_1 | 0.00 g | 0.00 kWh |
| Feed #2_1_1 | 0.00 g | 0.00 kWh |
| Feed #2_1_1_1 | 0.00 g | 0.00 kWh |
| Feed #2_1_1_2 | 0.00 g | 0.00 kWh |
| Feed #2_1_2 | 0.00 g | 0.00 kWh |
| Feed #2_1_2_1 | 0.00 g | 0.00 kWh |
| Feed #2_1_2_2 | 0.00 g | 0.00 kWh |
| Feed #3 | 102.96 g | 4.68 kWh |
| Feed #3_1 | 102.96 g | 4.68 kWh |
| Feed #3_1_1 | 77.22 g | 3.51 kWh |
| Feed #3_1_1_1 | 25.74 g | 1.17 kWh |
| Feed #3_1_1_2 | 51.48 g | 2.34 kWh |
| Feed #3_1_2 | 25.74 g | 1.17 kWh |
| Feed #3_1_2_1 | 25.74 g | 1.17 kWh |
| Feed #3_1_2_2 | 0.00 g | 0.00 kWh |
| Feed #4 | 25.74 g | 1.17 kWh |
| Feed #4_1 | 25.74 g | 1.17 kWh |
| Feed #4_1_1 | 25.74 g | 1.17 kWh |
| Feed #4_1_1_1 | 0.00 g | 0.00 kWh |
| Feed #4_1_1_2 | 25.74 g | 1.17 kWh |
| Feed #4_1_2 | 0.00 g | 0.00 kWh |
| Feed #4_1_2_1 | 0.00 g | 0.00 kWh |
| Feed #4_1_2_2 | 0.00 g | 0.00 kWh |

CO2 Footprint Report Macro

This macro displays a report of CO2 emissions for one or all datacenters in relation with the reference values for the existing energy feeds.






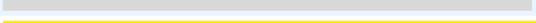



Parameters

- **datacenter**: the datacenter global unique identifier for which the report should be generated. This is an optional parameter. If it's not specified, then the report will contain all datacenters.

Example

```
[[reportCO2: datacenter=266d9653-9c8a-4496-ad3e-2f193e4a5794]] [[/reportCO2]]
```

Sample

| Feed / Datacenter | Value | Graph |
|----------------------|-------|--|
| Wind | 3 |  |
| Nuclear | 6 |  |
| Generic green | 22 |  |
| Solar | 60 |  |
| Generic | 217 |  |
| Loc. East | 407 |  |
| Gas | 430 |  |
| Generic fossile | 615 |  |
| Coal | 800 |  |

CPU vs. Power macro

This macro displays a graph with CPU usage and power consumption for a device.

Parameters

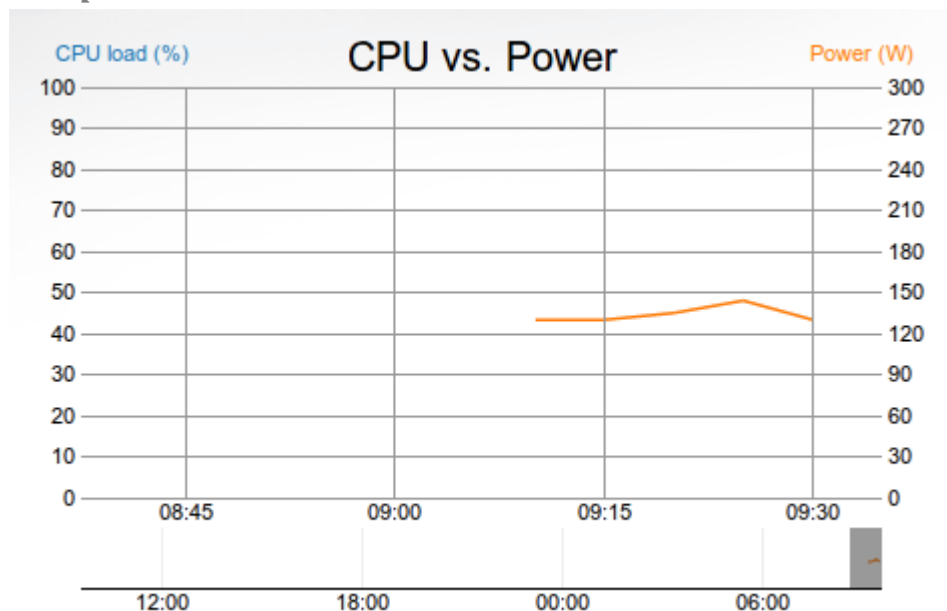
CPU vs. Power macro accepts the following parameter:

- **deviceguid** - the global unique identifier of the device for which the graph should be displayed.

Example

```
[ [cpuvspower:deviceguid=dd3d4536-7fdc-4503-958f-1100a9818c88/] ]
```

Sample



Camera Macro

Camera Macro allows you to connect and see images from an ip camera.

Parameters

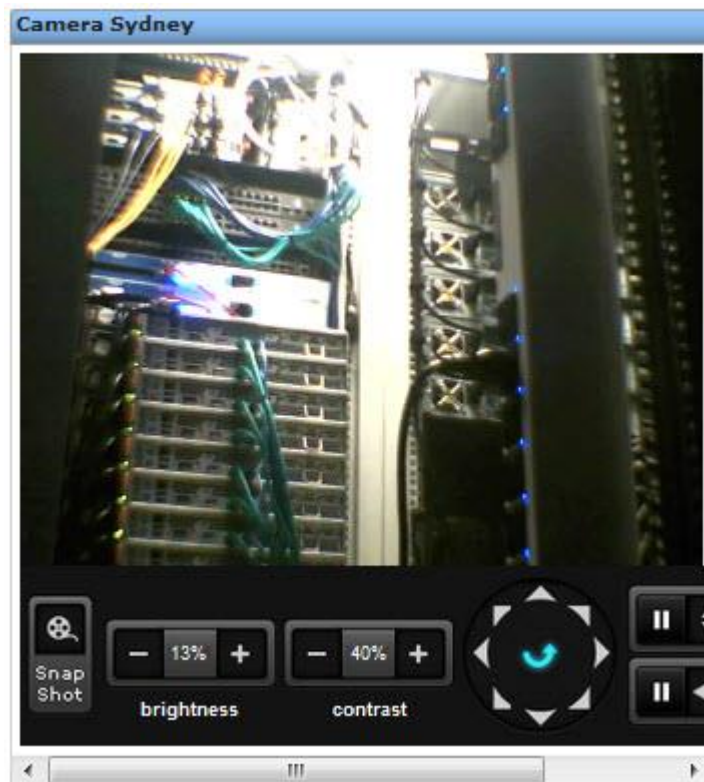
This macro accepts the following parameters:

- **ip**: the IP address of the camera
- **camtype**: camera type. It can be either 'apexisptz' or 'dlink2121'.
- **user**: the username used to connect to the camera
- **password**: the password used to connect to the camera

Example

```
[[camera: ip=10.25.25.1, camtype=dlink2121, user=joe, password=pass123]] [[/camera]]
```

Sample



Children Macro

The `children` macro creates a tree-view of a certain page and all its child pages.

Parameters

- **depth**: integer that indicates how many levels deep you want to show the child pages.
- **root**: optional, name of the page whose child pages you want to show. If not provided, all pages of the space will be taken into account

Example

Assuming we want to show the children of the `Macros_Home` page, we would add:

```
[[children]]  
depth:2
```

```
root:Macros_Home
[[/children]]
```

Dashboard Macro

The dashboard macro allows you to create a page to which you can add widgets. This way you can create a custom page with your favorite widgets.

Parameters

- config: the name of the config parameter can be freely chosen, but a name is mandatory..

Example

```
[[dashboard:config=example_dashboard_config]][[/dashboard]]
```

Sample



Device Management Macro

Device Management Macro allows you to manage devices as described in [Creating and Configuring Devices](#) section.

Parameters

This macro accepts the following parameter:

- deviceguid - the global unique identified the the device to be managed

Example

```
[[devicemanagement:deviceguid=8a71c7c5-f844-455d-9069-ada00dfce8b2]][[/devicemanagement]]
```

Sample



Energy Cost per Application Report Macro

This macro allows you to view a cost report for applications running on one or more devices.

Parameters

This macro accepts the following parameters:

- displayEnergy (true/false) - display the energy consumption for each application (optional). If not specified then true is assumed.
- displayCost (true/false) - display the cost for each application (optional). If not specified then true is assumed.
- locationGuid - the GUID of the location for which to make the report (optional)
- datacenterGuid - the GUID of the datacenter for which to make the report (optional)
- deviceGuid - the GUID of the device for which to make the report (optional)

Example

```
[[reportenergycostperapplication/]]
```

Sample

| Device | Application | CPU usage | Energy usage | Cost |
|--------|-----------------|-----------|--------------|-----------|
| device | check-new-relea | 1.00 % | 0.03 kWh | 0.00 EURO |
| device | dhclient3 | 0.00 % | 0.00 kWh | 0.00 EURO |
| device | racktivity-agen | 0.00 % | 0.00 kWh | 0.00 EURO |
| device | atd | 0.00 % | 0.00 kWh | 0.00 EURO |
| device | cpuset | 0.00 % | 0.00 kWh | 0.00 EURO |
| device | rsyslogd | 0.00 % | 0.00 kWh | 0.00 EURO |
| device | upstart-udev-br | 0.00 % | 0.00 kWh | 0.00 EURO |
| device | kworker/0:0 | 0.00 % | 0.00 kWh | 0.00 EURO |
| device | ecryptfs-kthrea | 0.00 % | 0.00 kWh | 0.00 EURO |
| device | ata_sff | 0.00 % | 0.00 kWh | 0.00 EURO |

Energy Switch Actions Macro

Energy Switch Actions Macro allows you to control the power ports for a certain energy switch. Ports can be powered on and off, and also threshold and priority can be set for each port.

Parameters

This macro accepts the following parameters:

- guid: energy switch global unique identifier

Example

```
[[pduactions: guid=0f2600b3-9409-4deb-afdd-d770ef13d134]] [[/pduactions]]
```

Sample

| Priority | Power cycle | OFF | Threshold |
|-------------------|-------------|-------------|-----------|
| 1. TENV713 | Priority: 1 | Power cycle | OFF |
| 2. TENV712 | Priority: 4 | Power cycle | OFF |
| 3. TENV714 | Priority: 4 | Power cycle | OFF |
| 4. TENV715 | Priority: 4 | Power cycle | OFF |
| 5. TENV711 | Priority: 4 | Power cycle | OFF |
| 6. TENV710 | Priority: 4 | Power cycle | OFF |
| 7. ro-autoinstall | Priority: 4 | Power cycle | OFF |
| 8. MGMT-SW | Priority: 1 | Power cycle | OFF |

Energy per Application Report Macro

This macro allows you to view the energy consumed by applications running on one or more devices.

Parameters

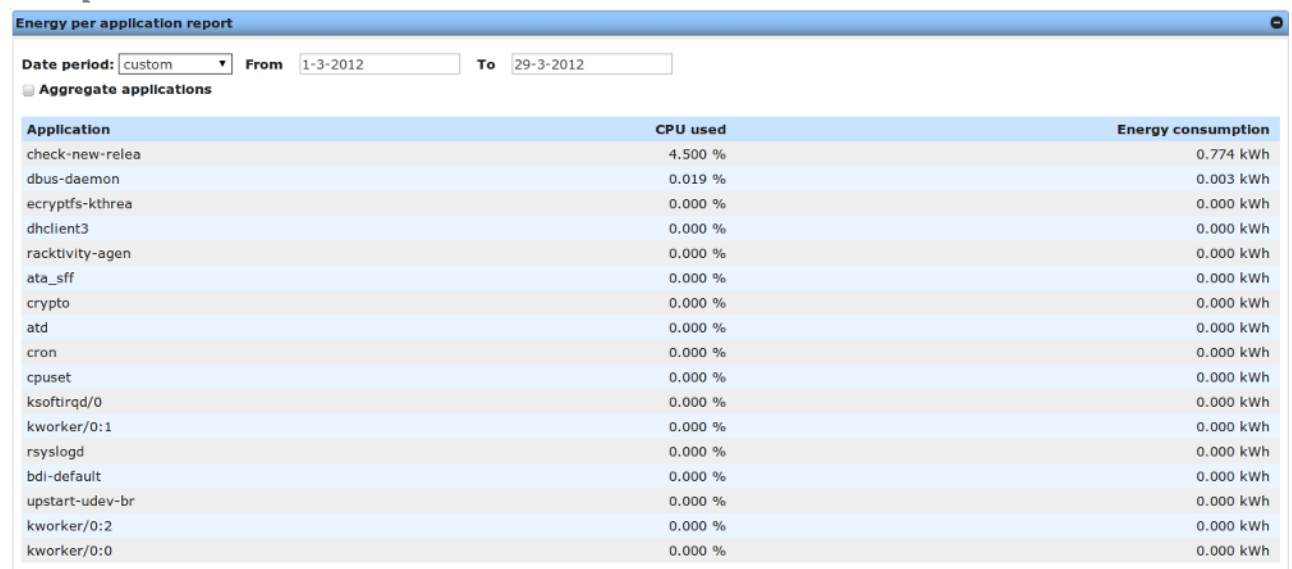
This macro accepts the following parameter:

- **guid** (optional) - the GUID of the device for which to make the report. If not specified then all devices will be included.

Example

```
[ [reportenergyperapplication:guid=8a71c7c5-f844-455d-9069-ada00dfce8b2/] ]
```

Sample



The screenshot shows a window titled "Energy per application report". It has a "Date period:" dropdown set to "custom", and "From" and "To" date fields set to "1-3-2012" and "29-3-2012" respectively. Below these is a checkbox labeled "Aggregate applications" which is checked. The main content is a table with three columns: "Application", "CPU used", and "Energy consumption".

| Application | CPU used | Energy consumption |
|-------------------|----------|--------------------|
| check-new-relea | 4.500 % | 0.774 kWh |
| dbus-daemon | 0.019 % | 0.003 kWh |
| ecryptfs-kthrea | 0.000 % | 0.000 kWh |
| dhclient3 | 0.000 % | 0.000 kWh |
| rackactivity-agen | 0.000 % | 0.000 kWh |
| ata_sff | 0.000 % | 0.000 kWh |
| crypto | 0.000 % | 0.000 kWh |
| atd | 0.000 % | 0.000 kWh |
| cron | 0.000 % | 0.000 kWh |
| cpuset | 0.000 % | 0.000 kWh |
| ksoftirqd/0 | 0.000 % | 0.000 kWh |
| kworker/0:1 | 0.000 % | 0.000 kWh |
| rsyslogd | 0.000 % | 0.000 kWh |
| bdi-default | 0.000 % | 0.000 kWh |
| upstart-udev-br | 0.000 % | 0.000 kWh |
| kworker/0:2 | 0.000 % | 0.000 kWh |
| kworker/0:0 | 0.000 % | 0.000 kWh |

Energy per Customer Detailed Report Macro

This macro displays a detailed report of power consumption for customers.

Parameters

Energy per customer detailed report macro accepts the following parameters:

- **displayEnergy** (true/false - default true) - display the energy consumption for each customer
- **displayCost** (true/false - default true) - display the cost of energy consumption for each customer
- **locationGuid** (optional) - make the report only for a specific location
- **datacenterGuid** (optional) - make the report only for a specific datacenter
- **top** (optional, defaults to 10) - the number of customers to be displayed in the report

Example

```
[ [reportenergypercustomerdetails] ] [ [/reportenergypercustomerdetails] ]
```

Sample

| Energy per customer detailed report | | |
|-------------------------------------|--------------|----------------------------|
| Select datacenter: | datacenter ▼ | |
| Date period: | custom ▼ | From 1-3-2012 To 29-3-2012 |
| Client name | Energy usage | Cost |
| customer1 | 45.22 kWh | 0.00 EURO |
| Average | 45.22 kWh | 0.00 EURO |
| Not Connected | 0.00 kWh | 0.00 EURO |

Energy per Customer Report Macro

This macro displays a report of energy consumption for customers.

Parameters

Energy per Customer Report Macro accepts the following parameters:

- displayEnergy (true/false - default true) - display the energy consumption for each customer
- displayCost (true/false - default true) - display the cost of energy consumption for each customer
- locationGuid (optional) - make the report only for a specific location
- datacenterGuid (optional) - make the report only for a specific datacenter
- top (optional, defaults to 10) - the number of customers to be displayed in the report

Example

```
[[reportenergypercustomer]] [[/reportenergypercustomer]]
```

Sample

| Energy per customer report | | | |
|----------------------------|--------------|---------|-----------|
| Customers | Energy usage | | Cost |
| customer1 | 45.14 kWh | 100.00% | 0.00 EURO |
| Average | 45.14 kWh | 100.00% | 0.00 EURO |
| Not Connected | 0.00 kWh | 0.00% | 0.00 EURO |

Energy per Device Detailed Report Macro

This macro displays a detailed report of energy consumption for devices.

Parameters

Energy per device detailed report macro accepts the following parameters:

- displayEnergy (true/false - default true) - display the energy consumption for each customer
- displayCost (true/false - default true) - display the cost of energy consumption for each customer
- locationGuid (optional) - make the report only for a specific location
- datacenterGuid (optional) - make the report only for a specific datacenter

Example

```
[[reportenergyperdevicedetails/]]
```

Sample

| Energy per device report | | |
|--------------------------|--------------|----------------------------|
| Select datacenter: | datacenter ▼ | |
| Date period: | custom ▼ | From 1-3-2012 To 29-3-2012 |
| Devices | Energy usage | Cost |
| datacenter | | |
| device | 17.77 kW | 0.00 EURO |

Energy per Device Report Macro

This macro displays a report of energy consumption for devices.

Parameters

Energy per device report macro accepts the following parameters:

- displayEnergy (true/false - default true) - display the energy consumption for each customer
- displayCost (true/false - default true) - display the cost of energy consumption for each customer
- locationGuid (optional) - make the report only for a specific location
- datacenterGuid (optional) - make the report only for a specific datacenter

Example

```
[[reportenergyperdevice/]]
```

Sample

| Energy per device report | | |
|--------------------------|--------------|-----------|
| Devices | Energy usage | Cost |
| datacenter | | |
| device | 17.74 kW | 0.00 EURO |

Feeds Detailed Report Macro

This macro displays a detailed report of current consumption for each feed within a particular datacenter.

Parameters

- guid: the datacenter global unique identifier for which the report should be generated.

Example

```
[[reportfeedsdetails:guid=266d9653-9c8a-4496-ad3e-2f193e4a5794]] [[/reportfeedsdetails]]
```

Sample

| Feeds | Current usage | Usage | Maximum Capacity | Minimal Usage | Maximal Usage |
|---------------|---------------|-------|------------------|---------------|---------------|
| Feed #1 | 15.03 A | 0.30% | 5074.00 A | 9.00 A | 12.00 A |
| Feed #1_1 | 15.03 A | 0.25% | 6088.80 A | 9.00 A | 12.00 A |
| Feed #1_1_1 | 15.03 A | 0.41% | 3653.28 A | 9.00 A | 12.00 A |
| Feed #1_1_1_1 | 10.00 A | 0.46% | 2191.97 A | 6.00 A | 8.00 A |
| Feed #1_1_1_2 | 5.03 A | 0.23% | 2191.97 A | 3.00 A | 4.00 A |
| Feed #1_1_2 | 0.00 A | 0.00% | 3653.28 A | 0.00 A | 0.00 A |
| Feed #1_1_2_1 | 0.00 A | 0.00% | 2191.97 A | 0.00 A | 0.00 A |
| Feed #1_1_2_2 | 0.00 A | 0.00% | 2191.97 A | 0.00 A | 0.00 A |
| Feed #2 | 0.00 A | 0.00% | 6007.00 A | 0.00 A | 0.00 A |
| Feed #2_1 | 0.00 A | 0.00% | 7208.40 A | 0.00 A | 0.00 A |
| Feed #2_1_1 | 0.00 A | 0.00% | 4325.04 A | 0.00 A | 0.00 A |
| Feed #2_1_1_1 | 0.00 A | 0.00% | 2595.02 A | 0.00 A | 0.00 A |
| Feed #2_1_1_2 | 0.00 A | 0.00% | 2595.02 A | 0.00 A | 0.00 A |
| Feed #2_1_2 | 0.00 A | 0.00% | 4325.04 A | 0.00 A | 0.00 A |
| Feed #2_1_2_1 | 0.00 A | 0.00% | 2595.02 A | 0.00 A | 0.00 A |
| Feed #2_1_2_2 | 0.00 A | 0.00% | 2595.02 A | 0.00 A | 0.00 A |
| Feed #3 | 18.33 A | 0.19% | 9752.00 A | 12.00 A | 16.00 A |
| Feed #3_1 | 18.33 A | 0.16% | 11702.40 A | 12.00 A | 16.00 A |
| Feed #3_1_1 | 13.96 A | 0.20% | 7021.44 A | 9.00 A | 12.00 A |
| Feed #3_1_1_1 | 4.23 A | 0.10% | 4212.86 A | 3.00 A | 4.00 A |
| Feed #3_1_1_2 | 9.72 A | 0.23% | 4212.86 A | 6.00 A | 8.00 A |
| Feed #3_1_2 | 4.37 A | 0.06% | 7021.44 A | 3.00 A | 4.00 A |
| Feed #3_1_2_1 | 4.37 A | 0.10% | 4212.86 A | 3.00 A | 4.00 A |
| Feed #3_1_2_2 | 0.00 A | 0.00% | 4212.86 A | 0.00 A | 0.00 A |
| Feed #4 | 4.84 A | 0.09% | 5604.00 A | 3.00 A | 4.00 A |
| Feed #4_1 | 4.84 A | 0.07% | 6724.80 A | 3.00 A | 4.00 A |
| Feed #4_1_1 | 4.84 A | 0.12% | 4034.88 A | 3.00 A | 4.00 A |
| Feed #4_1_1_1 | 0.00 A | 0.00% | 2420.93 A | 0.00 A | 0.00 A |
| Feed #4_1_1_2 | 4.84 A | 0.20% | 2420.93 A | 3.00 A | 4.00 A |
| Feed #4_1_2 | 0.00 A | 0.00% | 4034.88 A | 0.00 A | 0.00 A |
| Feed #4_1_2_1 | 0.00 A | 0.00% | 2420.93 A | 0.00 A | 0.00 A |
| Feed #4_1_2_2 | 0.00 A | 0.00% | 2420.93 A | 0.00 A | 0.00 A |

Feeds Report Macro

This macro displays a report of current consumption for each feed within a particular datacenter.

Parameters

- `guid`: the datacenter global unique identifier for which the report should be generated.

Example

```
[[reportfeeds:guid=266d9653-9c8a-4496-ad3e-2f193e4a5794]] [[/reportfeeds]]
```

Sample

| Feeds | Current usage | Usage | Maximum Capacity |
|---------------|---------------|-------|------------------|
| Feed #1 | 15.03 A | 0.30% | 5074.00 A |
| Feed #1_1 | 15.03 A | 0.25% | 6088.80 A |
| Feed #1_1_1 | 15.03 A | 0.41% | 3653.28 A |
| Feed #1_1_1_1 | 10.00 A | 0.46% | 2191.97 A |
| Feed #1_1_1_2 | 5.03 A | 0.23% | 2191.97 A |
| Feed #1_1_2 | 0.00 A | 0.00% | 3653.28 A |
| Feed #1_1_2_1 | 0.00 A | 0.00% | 2191.97 A |
| Feed #1_1_2_2 | 0.00 A | 0.00% | 2191.97 A |
| Feed #2 | 0.00 A | 0.00% | 6007.00 A |
| Feed #2_1 | 0.00 A | 0.00% | 7208.40 A |
| Feed #2_1_1 | 0.00 A | 0.00% | 4325.04 A |
| Feed #2_1_1_1 | 0.00 A | 0.00% | 2595.02 A |
| Feed #2_1_1_2 | 0.00 A | 0.00% | 2595.02 A |
| Feed #2_1_2 | 0.00 A | 0.00% | 4325.04 A |
| Feed #2_1_2_1 | 0.00 A | 0.00% | 2595.02 A |
| Feed #2_1_2_2 | 0.00 A | 0.00% | 2595.02 A |
| Feed #3 | 18.33 A | 0.19% | 9752.00 A |
| Feed #3_1 | 18.33 A | 0.16% | 11702.40 A |
| Feed #3_1_1 | 13.96 A | 0.20% | 7021.44 A |
| Feed #3_1_1_1 | 4.23 A | 0.10% | 4212.86 A |
| Feed #3_1_1_2 | 9.72 A | 0.23% | 4212.86 A |
| Feed #3_1_2 | 4.37 A | 0.06% | 7021.44 A |
| Feed #3_1_2_1 | 4.37 A | 0.10% | 4212.86 A |
| Feed #3_1_2_2 | 0.00 A | 0.00% | 4212.86 A |
| Feed #4 | 4.84 A | 0.09% | 5604.00 A |
| Feed #4_1 | 4.84 A | 0.07% | 6724.80 A |
| Feed #4_1_1 | 4.84 A | 0.12% | 4034.88 A |
| Feed #4_1_1_1 | 0.00 A | 0.00% | 2420.93 A |
| Feed #4_1_1_2 | 4.84 A | 0.20% | 2420.93 A |
| Feed #4_1_2 | 0.00 A | 0.00% | 4034.88 A |
| Feed #4_1_2_1 | 0.00 A | 0.00% | 2420.93 A |
| Feed #4_1_2_2 | 0.00 A | 0.00% | 2420.93 A |

Formula macro

The Formula macro provides the value of the formula created under the settings menu in the formula editor.

Parameters

None

Example

[[formula:guid=\$object.guid, formula=**Formula name**/]]

Generic Macro

The generic macro which renders content based on the PyLabs tags defined in the body of the macro and the context of the page.

The content that this macro renders is a result of the execution of certain tasklets. These tasklets are available in:

/opt/qbase5/pyapps/<yourapp>/impl/portal/pylabsmacro/<macroname>

Currently there are two test tasklets present in that directory:

- test1.py
- test2.py

When the Generic macro is called with 'debug' as one of the labels, test1.py is being executed. When the Generic macro is called with 'demo' as a label, test2.py is being executed. See below for more details about the Generic Macro.

Parameters

- The body of the macro should be a list of space separated tags and labels as defined by the Pylabs Tag format.

Example 1

The tasklet `test1.py` lists all the tags and labels in a page. As we have mentioned in explaining how the search functions, all the pages are created with default tags that are:

- `space:space_name`
- `page:page_name`

Where `space_name` is the name of the space and `page_name` is the name of the page. Sample 1 is the result of calling the Generic macro with 'debug' as one of the labels; code is shown below:

```
[[generic]]debug tagkey:tagvalue label sample[[/generic]]
```

Example 2

The tasklet `test2.py` on the other hand, only prints out a default message. Sample 2 is the result of calling the Generic macro with 'demo' as a label; code is shown below:

```
[[generic]]a:b demo[[/generic]]
```

Grid Macro

The grid macro is a macro that builds a table in which you can sort on the columns.

Parameters

The Grid macro does not accept parameters, all data is provided in the body of the macro. The columns are specified in a list like this:

```
"columns": ["Rack", "Description"]
```

For each row there's a dictionary that contains the values for each cell from that row. Also, for each column, there's a dictionary with options inside the "model" section. For instance, the "Rack" column has these options:

```
{
  "sortable": true,
  "formatter": "pagelink",
  "formatoptions": {
    "link": "path",
    "prefix": "#/Doc/"
  }
}
```

If the "sortable" option is set to true, then the table rows can be ordered based on the values from this column.

Also, there's a "formatter" option which specifies which type of formatting should be done for this column.

In this case, it is set to "pagelink". This means that links are automatically constructed

based on the options specified in "formatoptions" section.
For this type of formatting there are 3 possible options:

- link: specifies the key name from "data" section that contains the link for this table cell.
- prefix: contains a string that will be prepended for each link.
- suffix: contains a string that will be appended to each link.

The second column has a different formatting called "wizard".
This type of formatting takes these options:

```
"formatoptions": {  
  "title": "Example Wizard",  
  "name": "example_wizard",  
  "domain": "racktivity",  
  "type": "button",  
  "callback": "refresh"  
}
```

Basically, this type of formatting creates a [wizard](#) macro in each cell from "Description" column. "formatoptions" section contains the default parameters for all created wizards. These parameters are overridden by the ones specified inside the "data" section.

There are more formatting options available besides these two ones because the grid macro also supports [jqgrid](#) macro formatting options.

Example

```
[[grid]]  
{  
  "width": 601,  
  "name": "",  
  "pagesize": 10,  
  "hidetitlebar": true,  
  "autowidth": true,  
  "drag_opts": {"hoverClass": "nohover"},  
  "data": [  
    {"path": "MacroJqPlot", "Doc Page": "JqPlot Macro", "Wizard  
Example": {"extra":{"a":"b"}}},  
    {"path": "MacroOscilloscope", "Doc Page": "Oscilloscope Macro",  
"Wizard Example": {"extra":{"a":"b"}}},  
    {"path": "MacroLinegraph", "Doc Page": "Line Graph Macro", "Wizard  
Example": {"extra":{"a":"b"}}}  
  ],  
  "model": [  
    {  
      "sortable": true,  
      "formatter": "pagelink",  
      "formatoptions": {  
        "link": "path",  
        "prefix": "#/Doc/"  
      }  
    },  
    {  
      "sortable": false,  
      "formatter": "wizard",  
      "formatoptions": {  
        "title": "Example Wizard",  
        "name": "example_wizard",  
        "domain": "racktivity",
```

```

        "type": "button",
        "callback": "refresh"
    }
},
"columns": ["Doc Page", "Wizard Example"],
"height": 235
}
[[/grid]]

```

Sample

| Doc Page | Wizard Example |
|------------------------------------|----------------|
| JqPlot Macro | Example Wizard |
| Oscilloscope Macro | Example Wizard |
| Line Graph Macro | Example Wizard |

Heat Map Detailed Report Macro

This displays a detailed heat map report for a particular object (i.e. room or floor).

Parameters

- **guid**: global unique identifier for the object to be analyzed

Example

```

[[reportheatmapdetails:guid=e0021951-fba3-4454-93d8-10f24ac1a4cb]] [[/reportheatmapdetails]]

```

Sample

| Heatmap | | | | | | | | | |
|------------|------------|-----------|------------|------------|-----------|-----------|-----------|-----------|--|
| PDU | Last check | Current T | Last day r | Last day r | Last week | Last week | Last mont | Last mont | |
| RT 10.1.3. | 2011-11-2 | 32.2 °C | 25.2 °C | 35.5 °C | 24.3 °C | 35.5 °C | 24.3 °C | 35.5 °C | |
| RT 10.1.4. | 2011-11-2 | 35.8 °C | 25.2 °C | 35.8 °C | 24.3 °C | 36.4 °C | 24.3 °C | 36.4 °C | |
| RT 10.1.1. | 2011-11-2 | 32.5 °C | 28.1 °C | 32.5 °C | 27.1 °C | 33.0 °C | 27.1 °C | 33.0 °C | |
| RT 10.1.5. | 2011-11-2 | 30.3 °C | 25.2 °C | 35.3 °C | 24.3 °C | 35.8 °C | 24.3 °C | 35.8 °C | |
| RT 10.1.6. | 2011-11-2 | 33.9 °C | 25.2 °C | 35.5 °C | 24.3 °C | 35.8 °C | 24.3 °C | 35.8 °C | |
| RT 10.1.8. | 2011-11-2 | 34.8 °C | 25.2 °C | 35.8 °C | 24.3 °C | 36.4 °C | 24.3 °C | 36.4 °C | |
| RT 10.1.9. | 2011-11-2 | 34.8 °C | 25.2 °C | 35.3 °C | 24.3 °C | 35.8 °C | 24.3 °C | 35.8 °C | |
| RT 10.1.2. | 2011-11-2 | 35.8 °C | 25.2 °C | 35.8 °C | 24.3 °C | 35.8 °C | 24.3 °C | 35.8 °C | |
| RT 10.1.7. | 2011-11-2 | 29.9 °C | 25.2 °C | 35.8 °C | 24.3 °C | 35.8 °C | 24.3 °C | 35.8 °C | |
| RT 10.1.10 | 2011-11-2 | 32.5 °C | 25.2 °C | 35.3 °C | 24.3 °C | 35.3 °C | 24.3 °C | 35.3 °C | |

Include Macro

The `include` macro includes the content of another page in the current page.

Parameters

- **name:** Name of the page you which to include
- **space:** optional, name of the space where the page to include resides, if omitted, the current space is default.

Example

Assuming we want to include the page [SubPage](#) at the end of this page, we would add:

```
[[include:name=SubPage]][[/include]]
[[include:space=anotherSpace, name=SubPageOfAnotherSpace]][[/include]]
```

JqPlot Macro

The `jqplot` is a jQuery plugin to generate pure client-side JavaScript charts in your web pages.

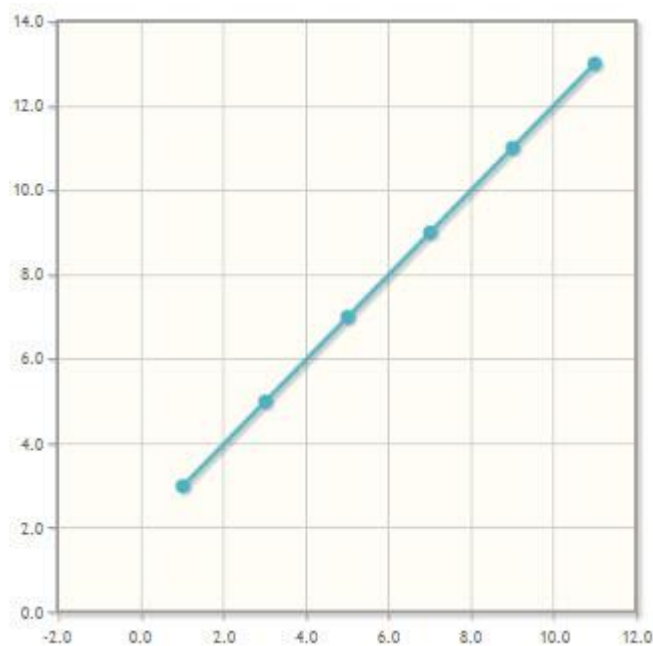
Parameters

The `jqplot` macro does not use parameters. The body contains the data to generate the chart.

Examples

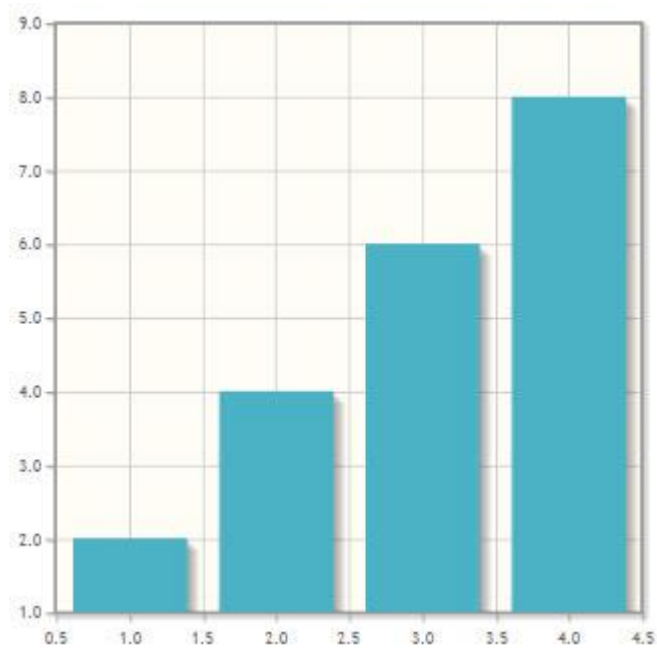
Line Chart

```
[[jqplot]]
{"width" : 400,
 "height" : 400,
 "chart_data" : [[[1, 3], [3, 5], [5, 7], [7, 9], [9, 11], [11, 13]]]}
[[/jqplot]]
```



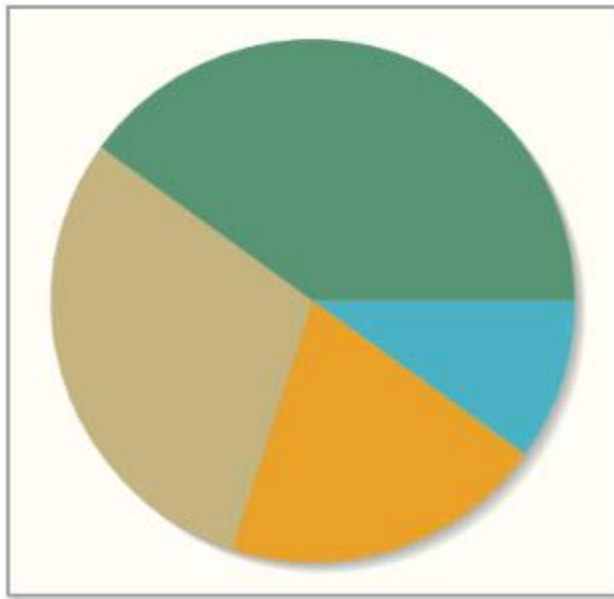
Bar Chart

```
[[jqplot]]
{"width" : 400,
 "height" : 400,
 "chart_data" : [[[1, 2],[2, 4],[3, 6],[4, 8]]],
 "renderer" : "$.jqplot.BarRenderer"
}
[/jqplot]]
```



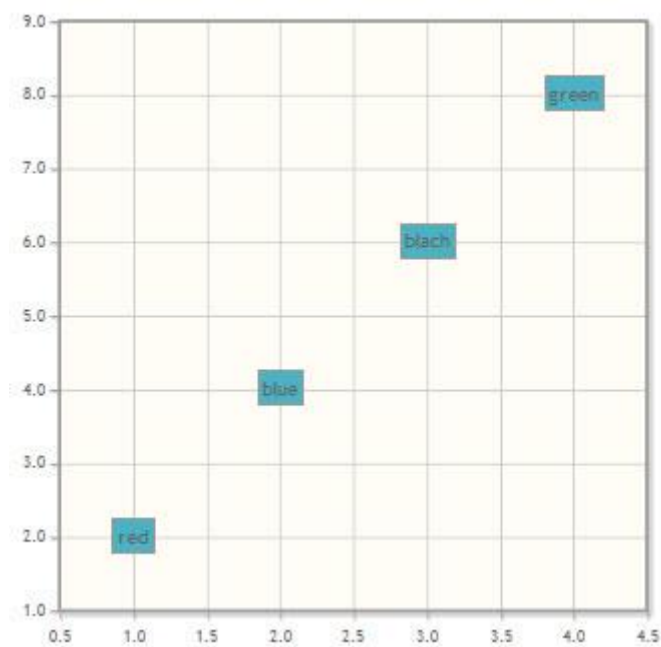
Pie Chart1

```
[[jqplot]]
{"width" : 400,
 "height" : 400,
 "chart_data" : [[[1, 2],[2, 4],[3, 6],[4, 8]]],
 "renderer" : "$.jqplot.PieRenderer"
}
[/jqplot]]
```



Block Chart

```
[[jqplot]]
{"width" : 400,
 "height" : 400,
 "chart_data" : [[[1, 2, "red"],[2, 4, "blue"],[3, 6, "black"],[4,
8,"green"]]],
 "renderer" : "$.jqplot.BlockRenderer"
}
[/jqplot]]
```



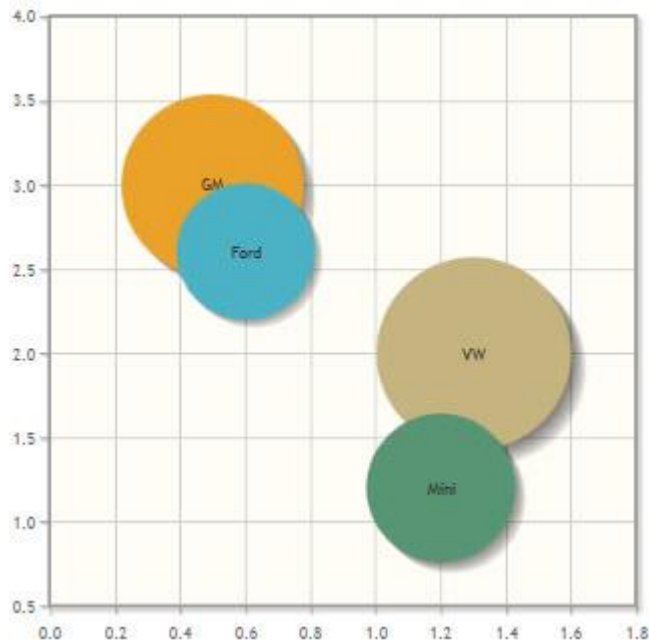
Bubble Chart

```
[[jqplot]]
{"width" : 400,
 "height" : 400,
```

```

"chart_data" : [[[0.6, 2.6, 12, "Ford"], [0.5, 3, 16, "GM"], [1.3, 2, 17,
"VW"], [1.2, 1.2, 13, "Mini"]]],
"renderer" : "$.jqplot.BubbleRenderer"
}
[/jqplot]]

```



Line Graph Macro

The Linegraph Macro allows you to view certain data for a particular object (location, datacenter, pdu etc.) For instance a graph with one of the following types of data can be shown:

- Voltage
- Power
- Active energy
- Frequency etc.

Parameters

This macro accepts the following parameters:

- type: the type of data to be shown (power, active energy, voltage etc.)
- guid: object global unique identifier
- timespan: show data for a particular time interval. For instance use 'e-1d' to show only data for last day. Other possible values are: 'e-1w' (last week) or 'e-1m' (last month).
- label: the label to be used for the graph.
- resolution: number of seconds for each data sample represented on the graph.

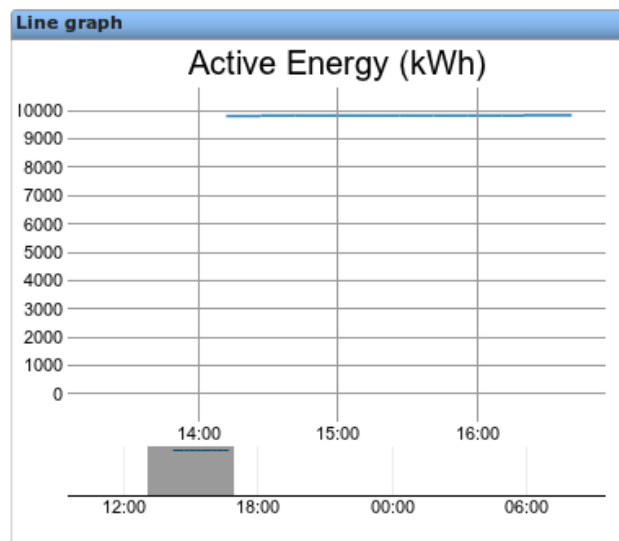
Example

```

[[linegraph:timespan=e-1d, guid=1609008f-1006-49f4-b599-e3eeecfdebd2,
type=activeenergy, label=Active Energy, resolution=900]][/linegraph]]

```

Sample



Map Editor Macro

The Map Editor Macro allows you to create and edit maps.

Parameters

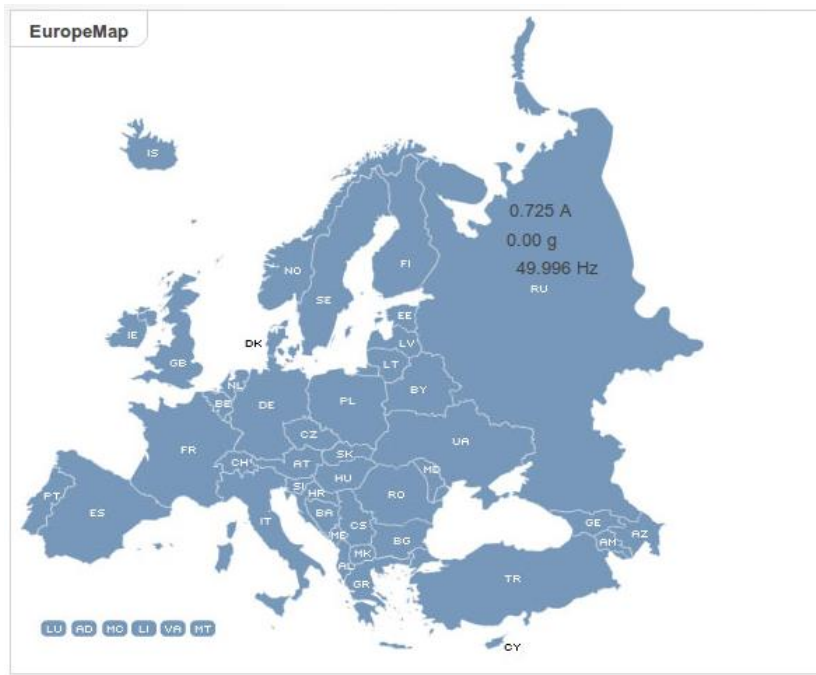
This macro accepts the following parameter:

- name: the name of the map to be displayed
This parameter is optional.
If specified then the map with the given name is displayed in read-only mode, otherwise it will be in edit mode.

Example

```
[[valuemap:name=EuropeMap/]]
```

Sample



Map Macro

Map macro displays a map on which an object (i.e. datacenter, location or enterprise) is marked.

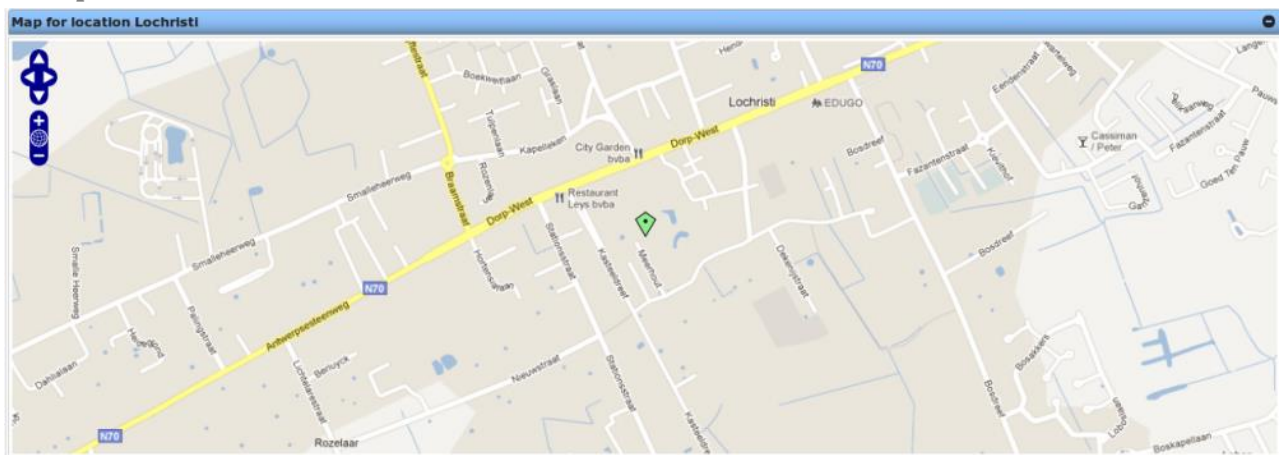
Parameters

- guid: global unique identifier for the object to be displayed on the map

Example

```
[ [map:guid=e0021951-fba3-4454-93d8-10f24ac1a4cb]] [ [/map]]
```

Sample



Monitormodule Live Data Macro

The Monitormodule Live Data Macro allows you to view live data for a particular energy consumer or feed monitor.

Parameters

This macro accepts the following parameters:

- guid: global unique identifier of energy consumer or feed monitor

Example

```
[[monitormodulelivedata:guid=1609008f-1006-49f4-b599-e3eeecfdebd2]] [[/monitormodulelivedata]]
```

Sample

| Live Data | | |
|-----------|-----------------|---------------------|
| | Parameter | Value |
| | Current time | 2011-11-22 10:01:13 |
| | Voltage | 226.33 V |
| | Current | 4.623 A |
| | Apparent Power | 1046.000 VA |
| | Power Factor | 0.87 |
| | Active Power | 918.000 W |
| | Active Energy | 1245.060 kWh |
| | Apparent Energy | 1407.919 VAh |
| | Frequency | 50.027 Hz |
| | Temperature | 26.1 °C |

Multi Bar Chart Macro

The Multi Bar Chart Macro allows you to view certain data for a particular object (location, datacenter, pdu etc.) and its children objects. For instance a bar chart with one of the following types of data can be shown:

- Voltage
- Power
- Active energy
- Frequency etc.

Parameters

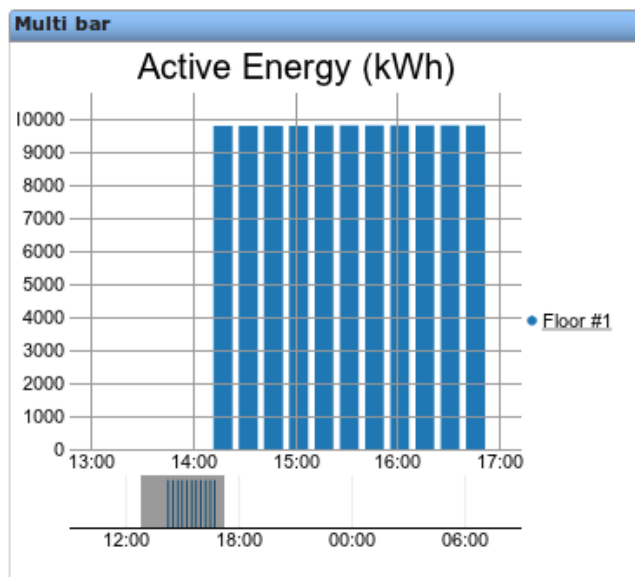
This macro accepts the following parameters:

- type: the type of data to be shown (power, active energy, voltage etc.)
- guid: object global unique identifier
- guids: object children global unique identifiers
- timespan: show data for a particular time interval. For instance use 'e-1d' to show only data for last day. Other possible values are: 'e-1w' (last week) or 'e-1m' (last month).
- refresh: number of seconds after which the graph should be refreshed.
- label: the label to be used for the graph.
- resolution: number of seconds for each data sample represented on the graph.

Example

```
[[multibarchart:timespan=e-1d, guid=1609008f-1006-49f4-b599-e3eeecfdebd2,
guids=5ebe9ab1-644c-4410-9cc0-871937eb792d type=activeenergy, refresh=30,
label=Active Energy, resolution=900]][[/multibarchart]]
```

Sample



Multi Line Graph Macro

The Multi Line Graph Macro allows you to view certain data for a particular object (location, datacenter, pdu etc.) and its children objects. For instance a line chart with one of the following types of data can be shown:

- Voltage
- Power
- Active energy
- Frequency etc.

Parameters

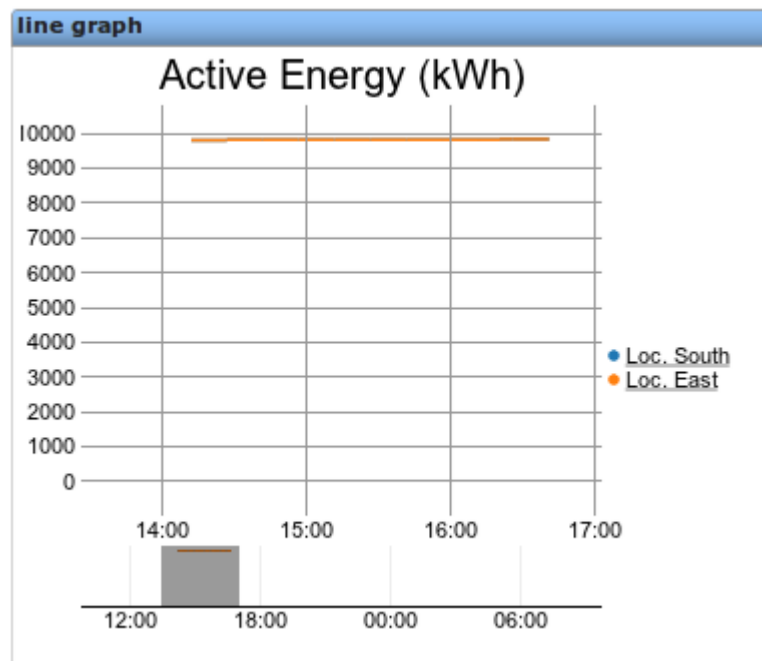
This macro accepts the following parameters:

- type: the type of data to be shown (power, active energy, voltage etc.)
- guid: object global unique identifier
- guids: object children global unique identifiers separated by url-encoded comas: '%2C'
- timespan: show data for a particular time interval. For instance use 'e-1d' to show only data for last day. Other possible values are: 'e-1w' (last week) or 'e-1m' (last month).
- refresh: number of seconds after which the graph should be refreshed.
- label: the label to be used for the graph.
- resolution: number of seconds for each data sample represented on the graph.

Example

```
[[multilinegraph:guid=2b0b1bac-427f-4d65-9b02-c6d30d994051, guids=564948b0-
7858-43a4-a85e-8972be3dd86a_1%2C564948b0-7858-43a4-a85e-
8972be3dd86a_2, types=activeenergy, label=Active Energy]][[/multilinegraph]]
```


Sample



Macro Notification

The notification macro is used to show a notification when the page which you are currently looking at is updated.

Parameters

- content: Content the notification should show when a new version of the current page comes available
- cssclass: CSS class that should be added to make the notification show (default customNotify)
- delay: Time the notification should be visible in milliseconds; -1 means infinity which is the default

Example

```
[[notification:content=This page is updated,delay=-1/]]
```

Sample

See the notification on top of your browser.

Oscilloscope Macro

Oscilloscope Macro allows you to display for a particular Energy Switch port one of the following:

1. Sine waves for current and voltage
2. Frequency harmonics amplitudes

Parameters

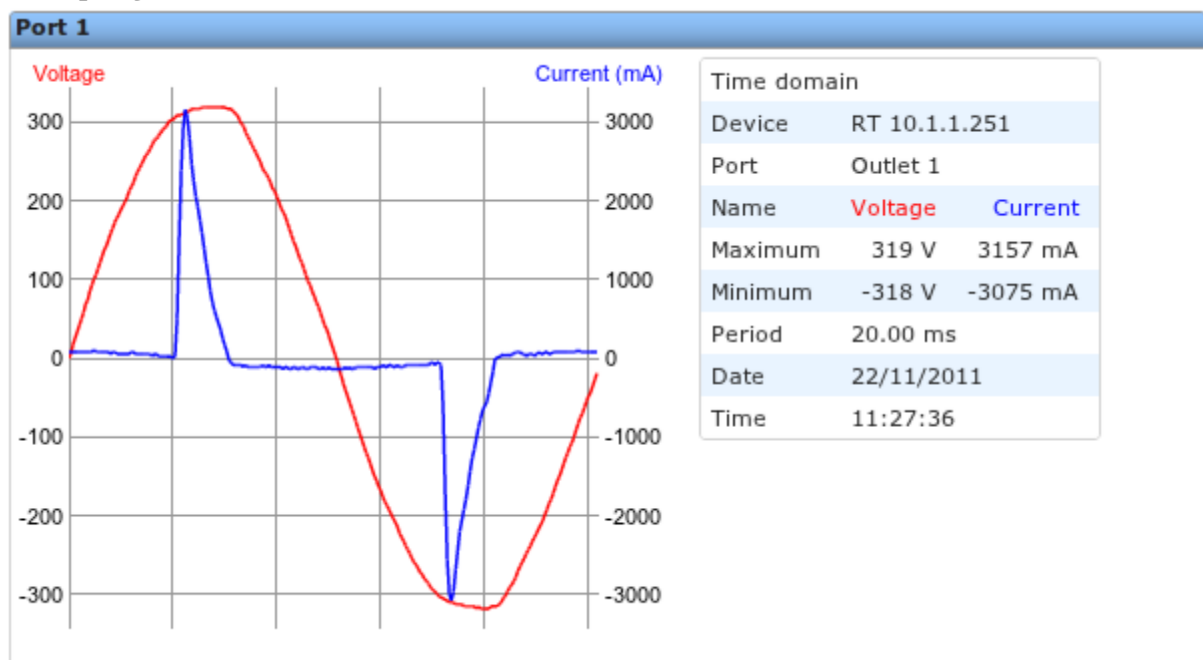
This macro accepts the following parameters:

- domain: the type of information to be displayed. It can be either time (for voltage and current sine waves) or frequency (for frequency harmonics amplitudes)
- pduguid: the PDU global unique identifier or powermoduleguid: the power module global unique identifier
- port: the port number to be analyzed, in two possible forms: port number or using powermodule id and port number(e.g.: P1.7)
- refresh: number of seconds after which the information should be refreshed

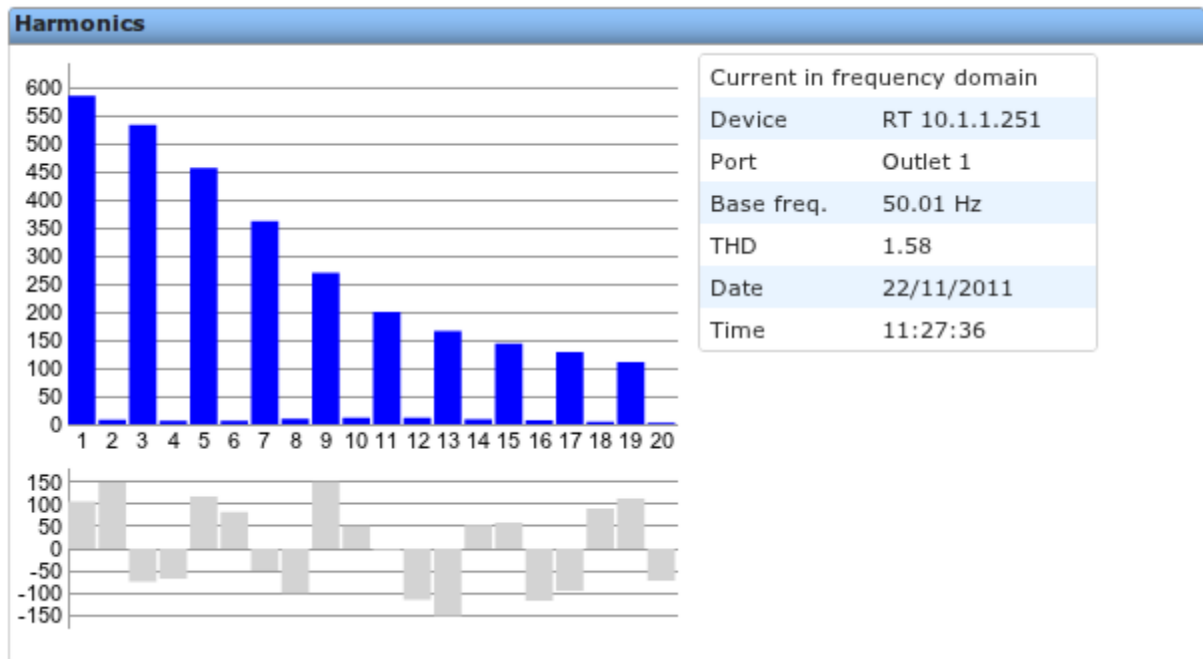
Examples

```
[[oscilloscope: domain=time, powermoduleguid=8f61a0ec-d7b5-473b-82b6-0e4121f6f347, port=7, refresh=30]][[/oscilloscope]]  
[[oscilloscope: domain=time, pduguid=0f2600b3-9409-4deb-afdd-d770ef13d134, port=7, refresh=30]][[/oscilloscope]]  
[[oscilloscope: domain=time, pduguid=0f2600b3-9409-4deb-afdd-d770ef13d134, port=P1.5, refresh=30]][[/oscilloscope]]
```

Sample for time domain



Sample for frequency domain



Page Tree Macro

The `pagetree` macro shows a flexible hierarchical tree view. It queries the database page schema and then forms a recursive tree of parent-children relation.

Parameters

The `pagetree` macro can take the `root` parameter which indicates the root page from which the page tree must be built.

Example

If you want to display all pages that you have use this call:

```
[[pagetree]][[/pagetree]]
```

Or if you want to display the children of a certain page, then put the page's name in the body as follows:

```
[[pagetree:root=Home]][[/pagetree]]
```

You can also show the pagetree of another space:

```
[[pagetree:space=AnotherSpace]][[/pagetree]]
```

Sample



Page Validator Macro

The `pagevalidator` macro creates a table displaying the state of all links and macros (broken/valid) found in a specific pages

Parameters

- **spaces:** optional, comma separated list of all spaces that should be validated (`spaces:*` means all spaces)
- **pages:** optional, comma separated list of page names that has to be checked. if not specified all pages are checked
- **showvalid:** optional, if `showvalid:false` only invalid links/macros will be displayed if neither "spaces" nor "pages" parameters are specified, default behavior is to check the current page and all child pages recursively

Example

Assuming we want to show the invalid links/macros in the entire project

```
[[pagevalidator]]
spaces:*
showvalid:false
[[/pagevalidator]]
```

Assuming we want to show the all links/macros in the current page and its child pages

```
[[pagevalidator]] [[/pagevalidator]]
```

Assuming we want to show the invalid links/macros of any page called Home or rest that is located in space API or space pylabs5

```
[[pagevalidator]]
spaces:Doc, Admin
showvalid:Home, rest
[[/pagevalidator]]
```

PDU Live Data Macro

The Pdu Live Data Macro allows you to view live data for a particular energy switch.

Parameters

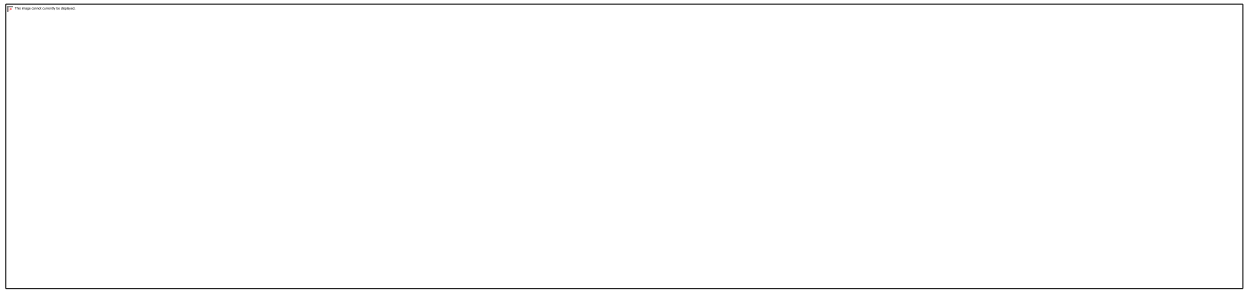
This macro accepts the following parameters:

- **guid:** energy switch global unique identifier
- **modules:** the modules for which the aggregated data should be retrieved (i.e. P1, P2)

Example

```
[[pdulivedata:guid=1609008f-1006-49f4-b599-e3eeecfdebd2,
modules=P1]] [[/pdulivedata]]
```

Sample



Pie Chart Macro

Pie Chart Macro allows you to view certain data for a particular object (location, datacenter, pdu etc.) and its children objects. For instance a pie chart with one of the following types of data can be shown:

- Voltage
- Power
- Active energy
- Frequency etc.

Parameters

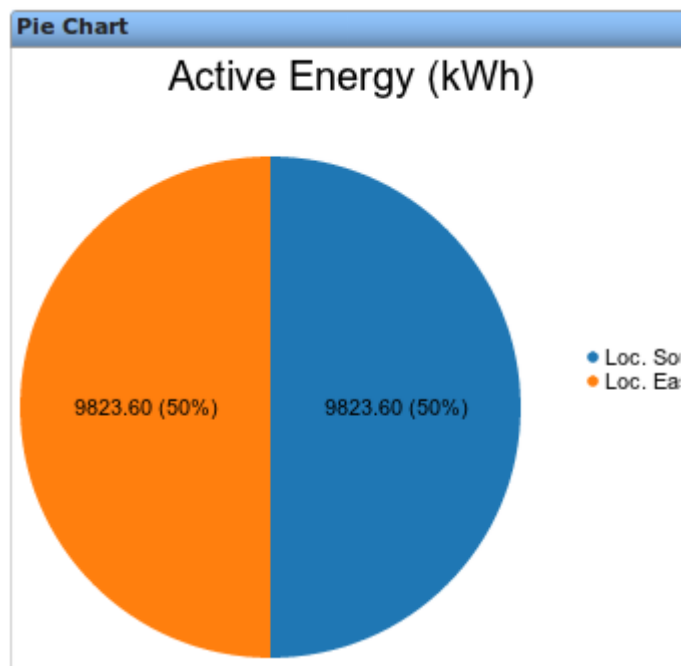
This macro accepts the following parameters:

- type: the type of data to be shown (power, active energy, voltage etc.)
- guid: object global unique identifier
- guides: object children global unique identifiers separated using url-escaped comma: '%2C'
- timespan: show data for a particular time interval. For instance use 'e-1d' to show only data for last day. Other possible values are: 'e-1w' (last week) or 'e-1m' (last month).
- refresh: number of seconds after which the graph should be refreshed.
- label: the label to be used for the graph.
- resolution: number of seconds for each data sample represented on the graph.

Example

```
[[piechart:timespan=e-1d,type=activeenergy,guids=564948b0-7858-43a4-a85e-8972be3dd86a%2C564948b0-7858-43a4-a85e-8972be3dd86a,refresh=30,label=Active Energy,guid=2b0b1bac-427f-4d65-9b02-c6d30d994051,resolution=86400,types=activeenergy]][[/piechart]]
```

Sample



Port Data Macro

The Port Data Macro allows you to view data for a particular energy switch, energy consumer, feed monitor or device with lowest level information.

Parameters

This macro accepts the following parameters:

- **guid**: global unique identifier of the component you would like to see data for
- **attributes**: name of the attributes (comma separated list)
- **portorientation**: 'rows' - one row per port (attributes in columns), 'cols' - one row per attribute (ports in columns)

Example

```
[ [portdata:guid=1609008f-1006-49f4-b599-e3eeecfdebd2,
attributes=current,power,powerfactor, portorientation=rows /]]
```

Sample

| test dc2 | | | |
|----------|------------|------------|----------|
| Name | DC Voltage | DC Current | DC Power |
| Line 1 | 47.93 V | 0.30 A | 10.00 W |
| Line 2 | 47.93 V | 0.10 A | 0.00 W |
| Line 3 | 47.93 V | 0.00 A | 0.00 W |
| Line 4 | 47.93 V | 0.10 A | 0.00 W |
| Line 5 | 47.93 V | 0.00 A | 0.00 W |
| Line 6 | 47.93 V | 0.40 A | 20.00 W |
| Line 7 | 47.12 V | 0.10 A | 0.00 W |
| Line 8 | 47.12 V | 0.00 A | 0.00 W |
| Line 9 | 47.12 V | 0.00 A | 0.00 W |
| Line 10 | 47.12 V | 0.00 A | 0.00 W |
| Line 11 | 47.12 V | 0.00 A | 0.00 W |
| Line 12 | 47.12 V | 0.00 A | 0.00 W |

Power per Customer Detailed Report Macro

This macro displays a detailed report of power consumption for customers.


Parameters

None

Example

```
[[reportPowerPerCustomerDetails]] [[/reportPowerPerCustomerDetails]]
```

Sample

| Client Name | Minimum usage | Maximum usage | Average usage | Usage |
|--|---------------|---------------|---------------|-------|
| Interval: Last day  | | | | |
| Customer4 | 1.86 | 1.95 | 1.89 | 7.405 |
| Customer23 | 1.85 | 1.95 | 1.89 | 7.386 |
| Customer50 | 0.94 | 0.98 | 0.95 | 3.730 |
| Customer19 | 0.94 | 0.98 | 0.95 | 3.730 |
| Customer81 | 0.94 | 0.98 | 0.95 | 3.730 |
| Customer84 | 0.94 | 0.98 | 0.95 | 3.728 |
| Customer27 | 0.93 | 0.98 | 0.95 | 3.710 |
| Customer46 | 0.93 | 0.98 | 0.95 | 3.709 |
| Customer66 | 0.93 | 0.98 | 0.95 | 3.708 |
| Customer36 | 0.93 | 0.98 | 0.95 | 3.706 |
| Customer6 | 0.93 | 0.98 | 0.95 | 3.705 |
| Customer47 | 0.93 | 0.98 | 0.95 | 3.701 |
| Customer9 | 0.93 | 0.97 | 0.95 | 3.701 |
| Customer35 | 0.93 | 0.97 | 0.95 | 3.701 |
| Customer3 | 0.93 | 0.97 | 0.95 | 3.700 |
| Customer13 | 0.93 | 0.97 | 0.95 | 3.699 |
| Customer1 | 0.92 | 0.98 | 0.95 | 3.698 |
| Customer31 | 0.93 | 0.97 | 0.95 | 3.698 |
| Customer76 | 0.93 | 0.98 | 0.95 | 3.698 |
| Customer25 | 0.93 | 0.98 | 0.95 | 3.696 |
| Customer93 | 0.93 | 0.97 | 0.95 | 3.695 |
| Customer26 | 0.93 | 0.97 | 0.95 | 3.695 |
| Customer58 | 0.93 | 0.96 | 0.95 | 3.693 |
| Customer80 | 0.92 | 0.98 | 0.94 | 3.690 |
| Customer55 | 0.93 | 0.97 | 0.94 | 3.689 |
| Average of not connected devices | 0 kW | 0 kW | 0 kW | 0 % |
| Average of connected devices | 25.59 kW | | | 100 % |

Power per Customer Report Macro

This macro displays a report of power consumption for customers.

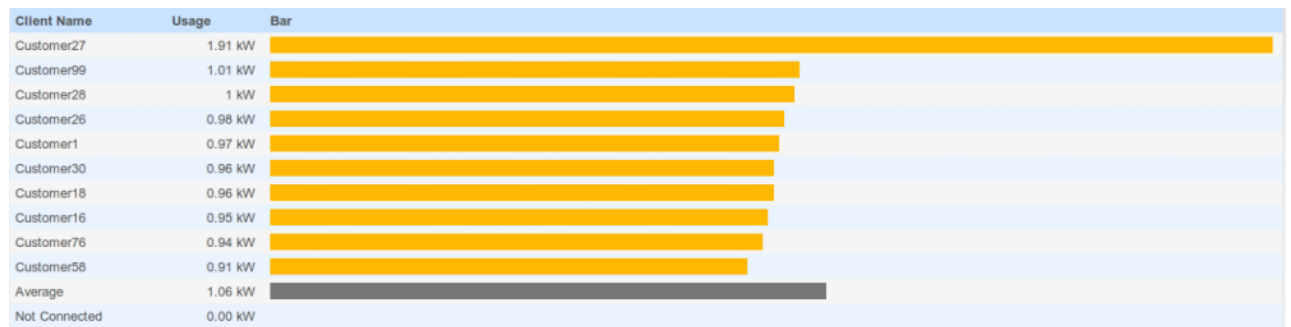
Parameters

None

Example

```
[[reportPowerPerCustomer]] [[/reportPowerPerCustomer]]
```

Sample



Protovis Macro

The `protovis` macro creates a zoomable line-graph where you provide the Y-values. These are automatically linked to default X-values. The values of your graphic are stored in a list. If you provide a list of lists, then you have a graphic for each list, but now displayed in one graph. This allows you to easily compare two sets of data.

Parameters

The macro does not use parameters. The body contains the data to generate the chart. The data provided in the body of the macro are the values of the Y-axis. Each provided Y-values corresponds with a complete unit of the X-axis, starting with 0 on the X-axis. In the example below, Y-value 1.7 corresponds with an X-value of 2.

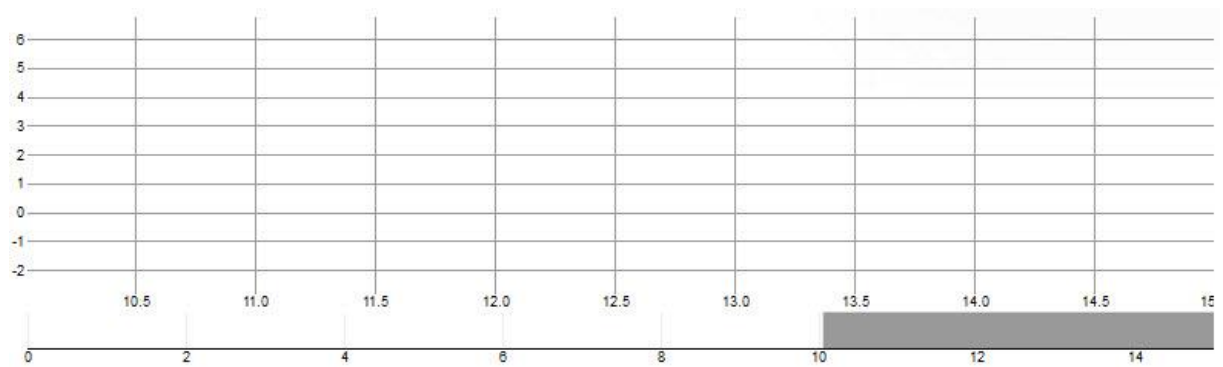
Below the graphic, you can scroll through your graphic and gives you an overview of the complete graph.

Example 1

Example for a graphic with one data stream:

```
[[protovis]]
{
  "width": 330,
  "data" : [1, 1.2, 1.7, 1.5, 0.7, 0.5, 0.2, -2, -0.4, 0, 3, 1.47, 2, 0,
6, 4.5],
  "protovis_id" : "protovis_div"
}
[[/protovis]]
```

Sample 1

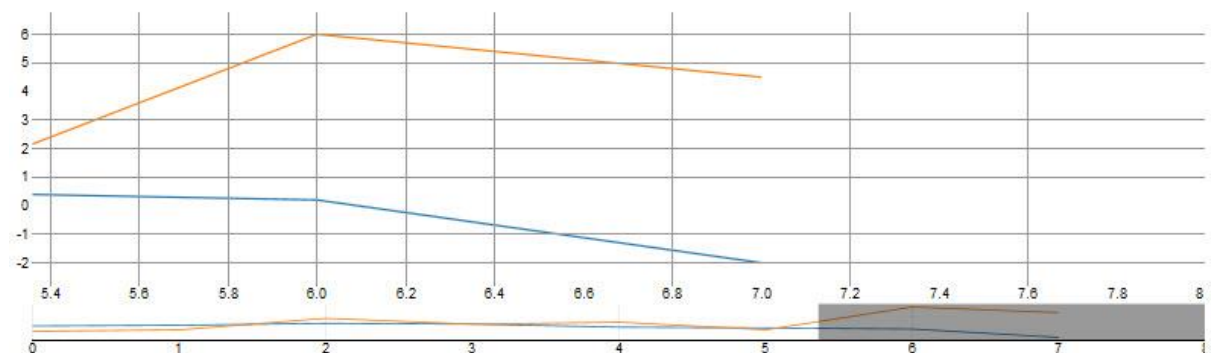


Example 2

Example for a graphic with two data streams:

```
[[protovis]]
{
  "width": 330,
  "data" : [[1, 1.2, 1.7, 1.5, 0.7, 0.5, 0.2, -2], [-0.4, 0, 3, 1.47, 2, 0,
6, 4.5]],
  "protovis_id" : "protovis_div"
}
[[/protovis]]
```

Sample 2



RGraph Macro

The RGraph macro creates an rgraph, which is a powerful graphics visualization. The data of the graph is stored in a JSON data structure.

Parameters

The macro does not use parameters. The body contains the data to generate the rgraph.

Example

```
[[rgraph]]
{
  "name": "Macros_Home",
  "chart_div": "bar_div",
  "values": {
    "root": {
```

```

    "name": "Root Node",
    "depth": 0,
    "children": [
      {
        "name": "child 1",
        "depth": 1,
        "children": [
          {
            "name": "child 1.1",
            "depth": 2
          }, {
            "name": "child 1.2",
            "depth": 2
          }
        ]
      }, {
        "name": "child 2",
        "depth": 1,
        "children": [
          {
            "name": "child 2.1",
            "depth": 2
          }, {
            "name": "child 2.2",
            "depth": 2
          }
        ]
      }
    ]
  }
}
[[/rgraph]]

```

Sample



Enterprise structure Macro

This macro displays a tree like representation of structure of the components of the enterprise (datacenters, floors, rooms etc.) You can quickly navigate through this tree and also change it.

Parameters

none

Example

```
[[enterprisestructure]][[/enterprisestructure]]
```

Sample



Redirect Macro

This macro redirects the current page to another page.

Parameters

- page: the name of the page where the browser should be redirected
- space: the space where the page belongs to

Overriding macro usage

As macro forces page change once you successfully added it to page, you will not be able to edit page again. In order to override redirect and stay on a page, please add noredirect to the url

Example

```
[[redirect: page=OtherMacros, space=Doc]][[/redirect]]
```

Schematics Macro

The Schematics Macro allows you to view a previously created schematic using the Schematics editor

Parameters

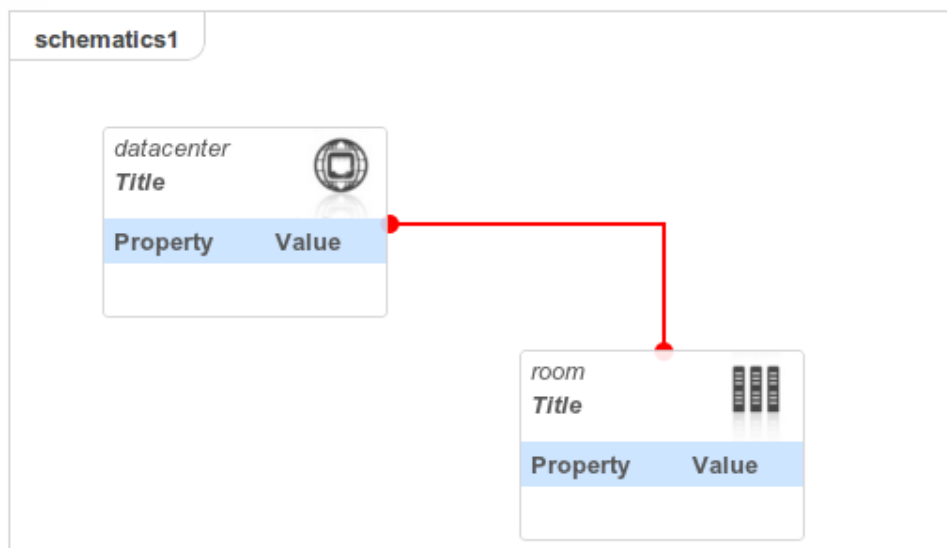
This macro accepts the following parameters:

- name: the name of the schematics to be displayed

Example

```
[[schematics:name=schematics1/]]
```

Sample



Script Macro

The script macro allows you to include javascripts in your text. There are two ways to include javascripts:

- as argument of the script macro, the argument refers to a javascript file
- as body of the script macro, the body is the javascript code itself

Parameters

- src: the path to the javascript file

Instead of referring to a javascript file, you can add the javascript code to the markdown file. See the example below.

Example

To call the script macro:

```
[[script]]
$('#mybutton').click(function() {
  alert("This is DCPM!");
});
[/script]]
```

<button id="mybutton">Alert</button>
or

```
[[script:src=http://path.to/javascriptfile.js/]]
```

Sample



Sensor Data Macro

Sensor Data Macro allows you to show information from a specific sensor module that is connected to a specific Energy Switch.

Parameters

This macro accepts the following parameters:

- **guid:** sensor module global unique identifier
- **type:** type of the environmental sensor
- **refresh:** number of seconds after which the data will be refreshed

Example

```
[[sensordata: guid=1609008f-1006-49f4-b599-e3eeecfdebd2, type=sensormodule, refresh=30]][[/sensordata]]
```

Stacked Area Chart Macro

The Stacked Area Chart Macro allows you to view certain data for a particular object (location, datacenter, pdu etc.) and its children objects. For instance a graph with one of the following types of data can be shown:

- Voltage
- Power
- Active energy
- Frequency etc.

Parameters

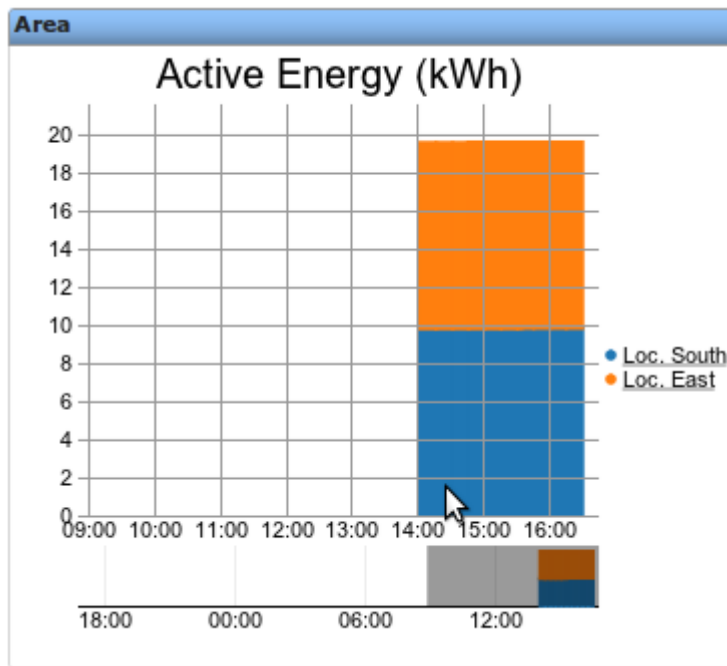
This macro accepts the following parameters:

- **type:** the type of data to be shown (power, active energy, voltage etc.)
- **guid:** object global unique identifier
- **guids:** object children global unique identifiers separated using url-escaped commas: '%2C'.
- **timespan:** show data for a particular time interval. For instance use 'e-1d' to show only data for last day. Other possible values are: 'e-1w' (last week) or 'e-1m' (last month).
- **label:** the label to be used for the graph.
- **resolution:** number of seconds for each data sample represented on the graph.

Example

```
[[stackedareachart:timespan=e-1d, type=activeenergy, guids=564948b0-7858-43a4-a85e-8972be3dd86a%2C564948b0-7858-43a4-a85e-8972be3dd86b, refresh=30, label=Active Energy, guid=2b0b1bac-427f-4d65-9b02-c6d30d994051, resolution=900, types=activeenergy]][[/stackedareachart]]
```

Sample



Style Macro

The `style` macro allows you to add a specific style to your page. Instead of using the default style of your application, you can choose to apply a custom style per page.

Parameters

- `src`: location to stylesheet file

Instead of referring to a stylesheet file, you can add css content to the markdown file. See the example below.

Example

```
[[style]]
p.my_style {
  font-size: 15px;
  font-family: "Times New Roman";
  font-style: italic;
}
[[/style]]
```

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quisque eu metus in mi vulputate convallis in vitae tellus. Mauris congue blandit felis id iaculis. Integer ut sodales ante. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos himenaeos. Sed vitae tempus tortor. Fusce ut mi eget mi aliquet viverra. Donec vel pellentesque leo. Vestibulum eget ipsum ac mi condimentum suscipit eget non ante. Aenean ultricies arcu augue, ac commodo magna. Donec ultricies sapien vel diam volutpat at lacinia lectus pretium. Nullam tortor nunc, congue ut mollis vel, commodo nec elit. Curabitur viverra eros sed lorem

euismod eget convallis tellus sodales. Nulla nisl magna, hendrerit id iaculis vitae, tincidunt et ligula. Duis vitae leo risus, ornare semper enim.

Sample

This page uses the style of the first example.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quisque eu metus in mi vulputate convallis in vitae tellus. Mauris congue blandit felis id iaculis. Integer ut sodales ante. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos himenaeos. Sed vitae tempus tortor. Fusce ut mi eget mi aliquet viverra. Donec vel pellentesque leo. Vestibulum eget ipsum ac mi condimentum suscipit eget non ante. Aenean ultricies arcu augue, ac commodo magna. Donec ultricies sapien vel diam volutpat at lacinia lectus pretium. Nullam tortor nunc, congue ut mollis vel, commodo nec elit. Curabitur viverra eros sed lorem euismod eget convallis tellus sodales. Nulla nisl magna, hendrerit id iaculis vitae, tincidunt et ligula. Duis vitae leo risus, ornare semper enim.

Table Macro

This macro draws a table based on the data provided in it's body.

Parameters

- height: the height of the table in pixels or as percentage

Example

This is an example with height specified in pixels.

```
[[table:height=200px]]
[
  ["Name", "Address"],
  ["Joe", "New York"],
  ["Sam", "Atlanta"]
]
[[/table]]
```

Sample

| Name | Address |
|------|----------|
| Joe | New York |
| Sam | Atlanta |

Widget Macro

The **Widget** macro allows you to add a widget to your page. In the body of the widget you put the macro that needs to be executed. By using the widget macro, one can allow to hide/show a macro on his page.

Parameters

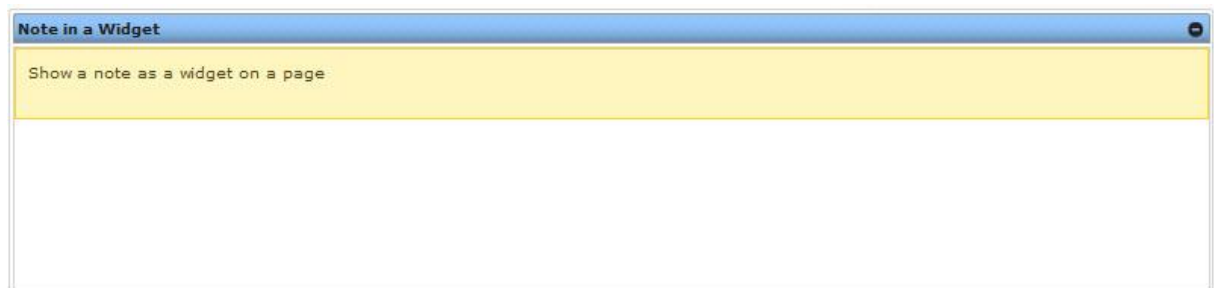
Besides the macro, added in the body of the **Widget** macro, this macro accepts four different parameters (all optional)

- **title**: title for the used macro in the widget
- **width**: set the width of the macro
- **height**: set the height of the macro
- **toggle**: true/false, turn off the possibility of showing the widget (false). Default this parameter is true.

Example

```
[[widget:title=Note in a Widget, width="100%", height=200, toggle=true]]
  [[note]]
    Show a note as a widget on a page
  [[/note]]
[[/widget]]
```

Sample



Wizards Macro

The **wizard** macro allows you to add a created in an Alkira page.

Parameters

- **appserver**: name of the application server that runs the wizard, by default the application server of the domain of your document
- **title**: title for your wizard, as it will appear in your document
- **name**: name of the wizard, must be the name of the directory in which the desired wizard is located
- **type**: type of element in your document, either **button** (by default) or **link**
- **appname**: name of the application which contains the wizard, by default the application in which your document is included
- **domain**: name of the domain in the application, by default the domain is the space
- **extra**: the 'extra' parameters used in the wizards

The **title** and **name** parameters are required, all other parameters are optional.

Example

Below you can find an example of how you can add wizards into a DCPM page:

```
[[wizard:title=Example
Wizard, domain=racktivity, name=example_wizard, type=button, callback=refresh]]
[[/wizard]]
```

It is recommended to always fill out the parameter appname and domain, but it is not required.

Sample



Input / output or both presentation macro

DCPM allows the user to present input, output or both measurement in one single box, Following macro code needs to be added for presentation of those values. This macro is only available as from DCPM version 1.4.

Parameters

Source=input: this presents input power

Source=output: This presents output power

Source=both: This presents both power values.

Example

```
[[widget:title=Total Power for
$templates.escapeWidgetParam($item.name),style=widgetThirdWidth $style, toggle=false,
more=#/View/$item.guid]]
[[totalpower:guid=$item.guid,source=both,textSize=20px]][[/totalpower]]
[[/widget]]
```

Sample

| Total Power for Belgium | | |
|-------------------------|---------|----------|
| | Output | Input |
| Total AC Power: | 7.59 kW | 19.37 kW |
| Total DC Power: | --- W | --- W |
| more... | | |

How to Create Macros

Adding dynamic content to a DCPM page is easy by using macros. There are two ways to add dynamic content:

1. using PyLabs tasklets
2. using JavaScript macros

Both options are explained in this section.

PyLabs Tasklets

Creating PyLabs macros is creating a directory in `/opt/qbase5/lib/python/site-packages/alkira/tasklets/pylabsmacro` and putting one or more tasklets in it. Once you have created the directory with a tasklet, you can start using the macro by using the directory name.

For example, create a directory `demo` in `/opt/qbase5/lib/python/site-packages/alkira/tasklets/pylabsmacro` and create a tasklet in it.

In your DCPM page you can then use the macro `[[demo]]`.

If you have more than one tasklet in the directory you must create a `match` function in the tasklets and provide a label or tags to the macro. See the [generic](#) macro page for an example.

JavaScript Macros

Instead of using PyLabs' macro system, you can also create your own macros in JavaScript. Below we elaborate how you can create a JavaScript macro by using the Google Maps macro as a reference.

Google Maps Macro Code

Below you can find an example of a macro that shows a static Google map.

```
//@metadata wizard=googlemaps
//@metadata description=Shows Google Maps static map of choice
//@metadata image=img/macros/googlemaps.png
//@metadata
documentationUrl=http://www.pylabs.org/#/alkiradocs/MacroGoogleMaps

var render = function(options) {
  var $this = $(this);
  //define params that user can provide when adding the macro to
a page
  var lat = parseFloat(options.params.latitude) || 51.1;
  var longitude = parseFloat(options.params.longitude) ||
3.83333;
  var width = parseFloat(options.params.width) || 250;
  var height = parseFloat(options.params.height) || 250;
  var zoom = parseFloat(options.params.zoom) || 8;

  var cb = function() {
    var latlng = new google.maps.LatLng(51.1, 3.833333);
    var myOptions = {
      zoom: 8,
```

```

        center: latlng,
        mapTypeId: google.maps.MapTypeId.ROADMAP
    };

    $.template('plugin.googlemaps.content', '<div><div
id="map_canvas" style="width:250px; height:250px"></div></div>');
    var result = $.tmpl('plugin.googlemaps.content',
myOptions);
    result.appendTo($this);

    var map = new
google.maps.Map(document.getElementById("map_canvas"), myOptions);
    };

    options.addCss({'id': 'googlemaps', 'tag': 'style', 'params': 'html
{ height: 100% }\
body
{ height: 100%; margin: 0px; padding: 0px }\
#map_canvas { height: 100% }\
'})
    options.addDependency(cb,
['http://maps.google.com/maps/api/js?sensor=false',
"http://maps.gstatic.com/intl/en_us/mapfiles/api-3/4/2/main.js"]);
    };

    register(render);

```

Creating a Macro

1. Create a macro file under `/opt/qbase5/www/lfw/js/macros/`, for example `macrotest.js`.

Note: `lfw` is the acronym for *Lightning Fast Wiki*, which is the Incubaid code name for the [Alkira][] project.

2. Set the metadata for your macro. This information is used in the widget store when adding a widget to a [Dashboard](#).
 - **//@metadata wizard:** name of the wizard that is launched when selecting the widget.
 - **//@metadata description:** description of the widget.
 - **//@metadata image:** link to image that is used in the widget store. The images must be stored in `/opt/qbase5/www/lfw/img/macros`, the link is relative from `/opt/qbase5/www/lfw/`.
 - **//@metadata documentationUrl:** link to the full documentation of the widget on `www.pylabs.org`
3. Define the parameters if any. You can set a default value for each parameter. In the example these parameters are defined with `options.params`, for example `var longitude = parseFloat(options.params.longitude);`. You can provide default values by adding double pipe characters: `var longitude = parseFloat(options.params.longitude) || 3.83333;`

4. There must be a render function which takes `options` as a parameter. Options is an object with some parameters that we can use, such as:
- **options.space**: get space name.
 - **options.page**: get page name.
 - **options.body**: get the page contents.
 - **options.tags**: get the tags of a page.
 - **options.params**: get the parameters that are passed to the macro tag, for example `[[note:param1=value1]]`.
 - **options.query**: retrieves the query from a URL, for example the query `?space=myspace&page=myspace` results in `options.query.space=myspace` and `options.query.page=myspace`.
 - **options.pagecontent**: get the content of a page in HTML code.
 - **options.app**: get an instance of the '[Sammy](#)' framework, which allows you to trigger actions.
 - **options.config**: get the configuration of the macro.
 - **options.saveConfig()**: saves the provided configuration of the macro.
 - **options.addCss()**: select a CSS style sheet either through a CSS file or a direct style code.
 - **options.addDependency()**: add a JavaScript library dependency if needed by the macro.
 - **options.swap()**: swap the old content of a page with new content.
 - **options.renderWiki()**: return the HTML element of a given Markdown syntax.
5. If you want to apply a special style sheet for your macro, you need the `options.addCss()` function. This function has three arguments:
- **id**: a unique id for your macro (usually just the macro name since it should be unique).
 - **tag**: either "style" or "link" tag, where:
 - **style**: is used if you're giving it CSS dumped syntax.
 - **link**: is used if you're giving it a CSS file to load.
 - **params**:
 - if the tag is style, params is a dumped CSS string (as shown in the example).
 - if the tag is link, params is a key/value object.

For example: `'params': {'rel': 'stylesheet', 'href': 'http://yandex.st/highlightjs/5.16/styles/default.min.css'}`

6. You can load extra JavaScript libraries in your macro with the `options.addDependency` function. This function requires two arguments:
- **callback**: callback function to be called after loading all dependency scripts, `cb` in the given example
 - **dependencies**: list of file links to be loaded.

In this case, you have to put all code that depends on the loaded dependencies in a callback function which you give as first argument to the `addDependency` function call.

7. Create a template using jQuery; `jQuery.template(name, template)` where:
 - **name:** A string naming the compiled template.
 - **template:** The HTML markup and/or text to be used as template. Can be a string, or an HTML element (or jQuery object wrapping an element) whose content is to be used as a template.
8. Render the specified HTML content as a template, using the specified data:

`jQuery.tmpl(name, [options])` where:
 - **name:** A string naming the compiled template.
 - **options:** An optional map of user-defined key-value pairs. Extends the `tmplItem` data structure, available to the template during rendering.
9. Register the render function using:
 - `register(render);`
10. Define your macro in a Markdown file.

Calling the Macro in a Markdown File

To call a macro in a Markdown file, you use the following format:

```
[[<macroname>]]  
    Macro body code goes here.  
[[/<macroname>]]
```

Where `macroname` is the name of your macro, i.e. the name of the JavaScript file. For example if we want to add the Google Maps macro, since it does not contain a body, we use:

```
[[googlemaps]] [[/googlemaps]]
```

Release notes:

Release Notes - DCPM Development - Version Release 1.4.0

- reports:
 - formulas in reports
 - input metrics in reports
 - monthly/weekly/daily automatic reporting (pdf, csv) (sent to email)
 - redone reports presented with macros (examples in Report space)
- maps:
 - formulas on maps
 - input metrics on maps
- alarms:
 - alarms triggered by formula values

- redone snmp alarms - speed up, early validation
 - added more information to user alarm definition list on pages
- graphs:
 - new graphs - auto refresh, new look and feel, synchronization between them
 - annotations on graphs (alarms)
 - zooming graphs on y axis
- hardware integration:
 - batteries integration on delta rectifier
 - battery test reports on delta rectifier
 - tunneling to hardware
 - calculated line current on apc ats (for hw that does not give data)
- default tags removed from edit wizards
- line names in monitormodules
- synchronization of names with hardware (line/device level)
- default credentials for pdu/monitormodule setup
- quicker pdu discovery
- added “add pdu” action on rack to manually add pdu
- outlet switching reported in audit log
- total power macro can report either input, output data or both
- smtp settings test on change
- possibility to omit some comment message boxes
- improved installation procedure
- implementation of AC2 version 3.0
- bugfixes:
 - rsyslog restart should not bring dcpm logs outside of chroot
 - ui presentation fixes
 - raritan port status not shown properly on pdu actions
 - installation script works for directories with spaces
 - formulas calculated on time period were rendering with no data on next period start
 - error on pdu reconfiguration/edit
 - errors on non-existing formula rendering
 - viewer user had no access to all facts tables
 - agent command on devices that are not reachable generated errors

Release Notes - DCPM Development - Version Release 1.5.0

Bug

- [DEVDCPM-1576] - rsyslog messages get transmitted to the rsyslog service outside the chroot
- [DEVDCPM-1719] - Applicationserver leaks memory
- [DEVDCPM-1721] - Profile monitoring and check high load (from 1.3.4)
- [DEVDCPM-1768] - Fault message when creating an alarm covers Cancel- and Next-buttons

[DEVDCPM-1771] - user should be able to disable scheduled reports.
[DEVDCPM-1776] - Created maps cannot be deleted any more, error is generated by DCPM
[DEVDCPM-1778] - create an SNMP alarm in DCPM for voltage on AC2 generates an error
[DEVDCPM-1780] - Creating AC2 version 3.1.0.52 is not working as energy consumer in DCPM
[DEVDCPM-1782] - replace the documentation space by a link to the online manual....
[DEVDCPM-1785] - Fileuploader.py is not checked by sanitychecker
[DEVDCPM-1786] - Scroll down button in the structure is not available physically
[DEVDCPM-1787] - Sending email directly from DCPM to report a bug, those emails do not arrive, also cc should be possible
[DEVDCPM-1788] - Live data widget is only possible for feed monitor, should include energy consumer too
[DEVDCPM-1790] - sending an alarm email to multiple email addresses, is not working.
[DEVDCPM-1799] - make sure when you search for an item in the search box, added labels are listed too
[DEVDCPM-1801] - Alarm Definitions on Feed pages were not visible after update to 1.4.0
[DEVDCPM-1803] - Leaf nodes of feeds fail to load "Input and output information" data
[DEVDCPM-1807] - changing name on E2 is not reflected in reporting --> NRB Australia
[DEVDCPM-1809] - Reports by Metric don't work
[DEVDCPM-1810] - Only 20 items are shown in Direct Children grid widget
[DEVDCPM-1813] - Unable to create dashboard with temperature graphs for E2 module
[DEVDCPM-1816] - Fix installer to use "cp -p" instead of just "cp" to copy files
[DEVDCPM-1818] - It's not possible to set an alarm on DC2 Feed A or B separately.
[DEVDCPM-1826] - ACL Slaves do not consume licenses
[DEVDCPM-1827] - ACL Reconfigure wizard has wrong step-counter
[DEVDCPM-1828] - "Assign ACL Slaves" wizard looks weird

Feature Request

[DEVDCPM-1765] - Add section on the created reports under the setting menu & Stop scheduled reports
[DEVDCPM-1775] - Block non-evaluation when internal db is used
Improvement

[DEVDCPM-1714] - Add our new ACL master and Slave solution in DCPM
[DEVDCPM-1761] - creating a report: csv and pdf should be in capitals
[DEVDCPM-1767] - SNMP thresholds for AC2 input has a range from 1 to 5000A
[DEVDCPM-1779] - if license is expired user should be able to delete it and turn back to eval mode

Task

[DEVDCPM-1806] - Don't take ACL Master into account for licensing

Technical task

[DEVDCPM-1792] - when creating feed monitor on datacenter
[DEVDCPM-1793] - Remove power lines from ACLM,
[DEVDCPM-1796] - Input and output values
[DEVDCPM-1798] - Use Line 4 correctly for voltage, power and energy

Release Notes - DCPM Development - Version Release 1.5.1

Bug

- [DEVDCPM-1817] - Failed to set SNMP threshold for DCVoltage on DC2
- [DEVDCPM-1856] - Dropdown field too small when creating alarm definition on Feeds
- [DEVDCPM-1857] - Monitoring fails on DC2 when an alarm-definition was set on a DC2 Transducer
- [DEVDCPM-1861] - Send email indicating that there was no data available for a report
- [DEVDCPM-1862] - Create graphs in dashboard of 6 months data, 1 year data is working
- [DEVDCPM-1865] - recheck the Keep Alive functions in DCPM
- [DEVDCPM-1869] - Linegraph macro doesn't fill up the source type field

Improvement

- [DEVDCPM-1860] - Remove Pylabs documentation in the DCPM widgets

Technical task

- [DEVDCPM-1834] - Allow creating reports for items on which an alarm occurred
- [DEVDCPM-1835] - Add setting to reports to select the location of the reports
- [DEVDCPM-1858] - DASHBOARD - Allow combining data from multiple objects in one graph
- [DEVDCPM-1859] - Only look for alarms on the selected metrics when creating reports